TECHNOLOGY DEPT.

- Replacement studies in a new light
- Wetting agents in digester applications
- New drying and baling system
- Pipeline planning

The Paper Industry

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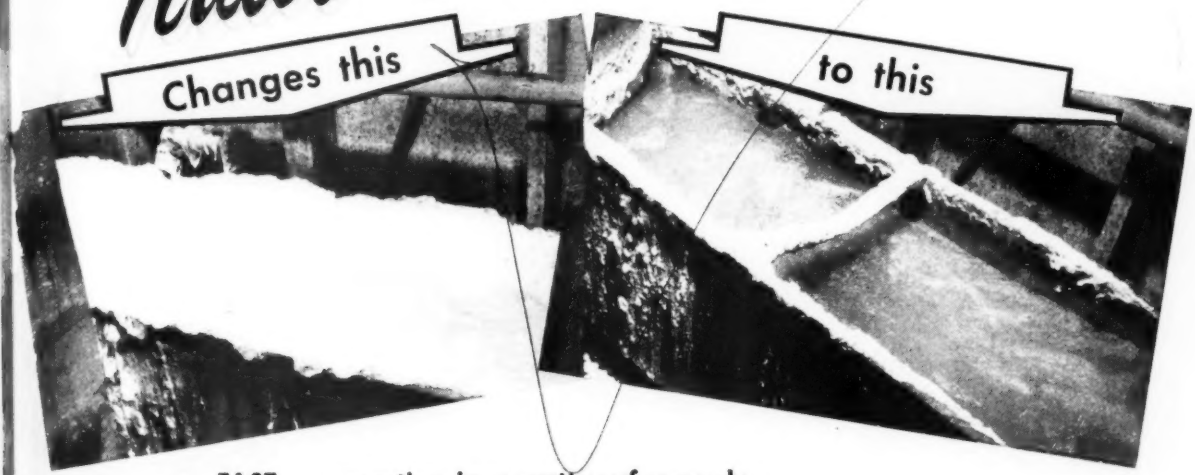
Publishers of PAPER AND PULP MILL CATALOGUE

V. 39
#5

Nalco 71-B LIQUID ANTIFOAM



- FAST . . . reaction in a matter of seconds
- EFFECTIVE . . . as a defoamer—as an antifoam
- FAR MORE ECONOMICAL . . . than paste or briquette

Here is what happened when *liquid* Nalco 71-B was tried in a well-known mill plagued with the foaming problem of high-resin pulp.

At a cost of only *one-sixth as much* as the previous antifoam, the mill reported Nalco 71-B *eliminates all foam in seconds!* Sheet quality remains high, and production stoppages and slow-downs due to foaming have been eliminated. Fibre loss to sewers is extremely low and cleaning of cell room and screens has been substantially reduced. Small wonder the mill continues to use Nalco *liquid* 71-B in both primary and secondary pulp screen processes.

There is a whole series of Nalco antifoams designed to get *results* like this in your mill. Ask your Nalco Representative about them, or write direct to Nalco.

NATIONAL ALUMINATE CORPORATION, 6232 West 66th Place, Chicago 38, Illinois • Telephone: POrtsmouth 7-7240
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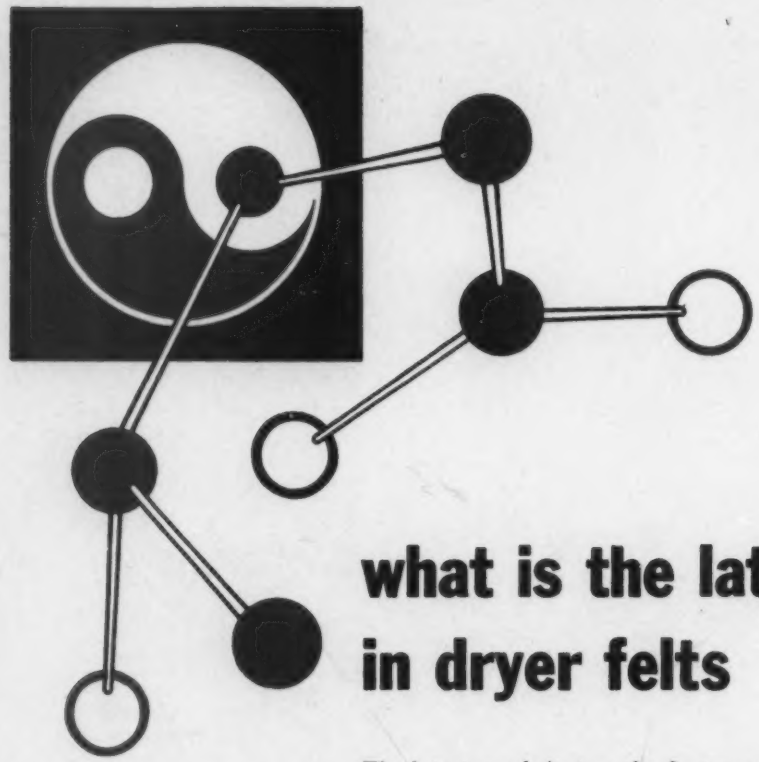
THE Nalco® SYSTEM...Serving the Paper Industry through Practical Applied Science



what is the latest word in dryer felts

The latest word, just as the first word, is ASTEN.®

In 1923, we pioneered the use of Asbestos Dryer Felts—and today more paper is being dried on ASTENS than on any other Dryer Felt.

Clipper Seams, widely used and imitated today, were first introduced and patented by us in 1930 (U.S. Pat. No. 1,748,880).

As to Synthetics—over fourteen years ago we anticipated their coming use in Dryer Felts and included them in United States Patent No. 2,317,910 granted April 27, 1943.

There are now four plants on this continent making every conceivable type of ASTEN Dryer Felt for the Paper Industry.

We manufacture to your varying needs without wishing to push any one particular grade or material.

Our representatives will gladly discuss with you whatever type may prove most suitable for your requirements, whether asbestos, cotton, synthetics, or a combination of two or more of these materials in any given percentage—for example, the felts in our R range (Reinforced asbestos) or the SYNCOT® (our SYNthetic reinforced COTton dryer felts), and others.

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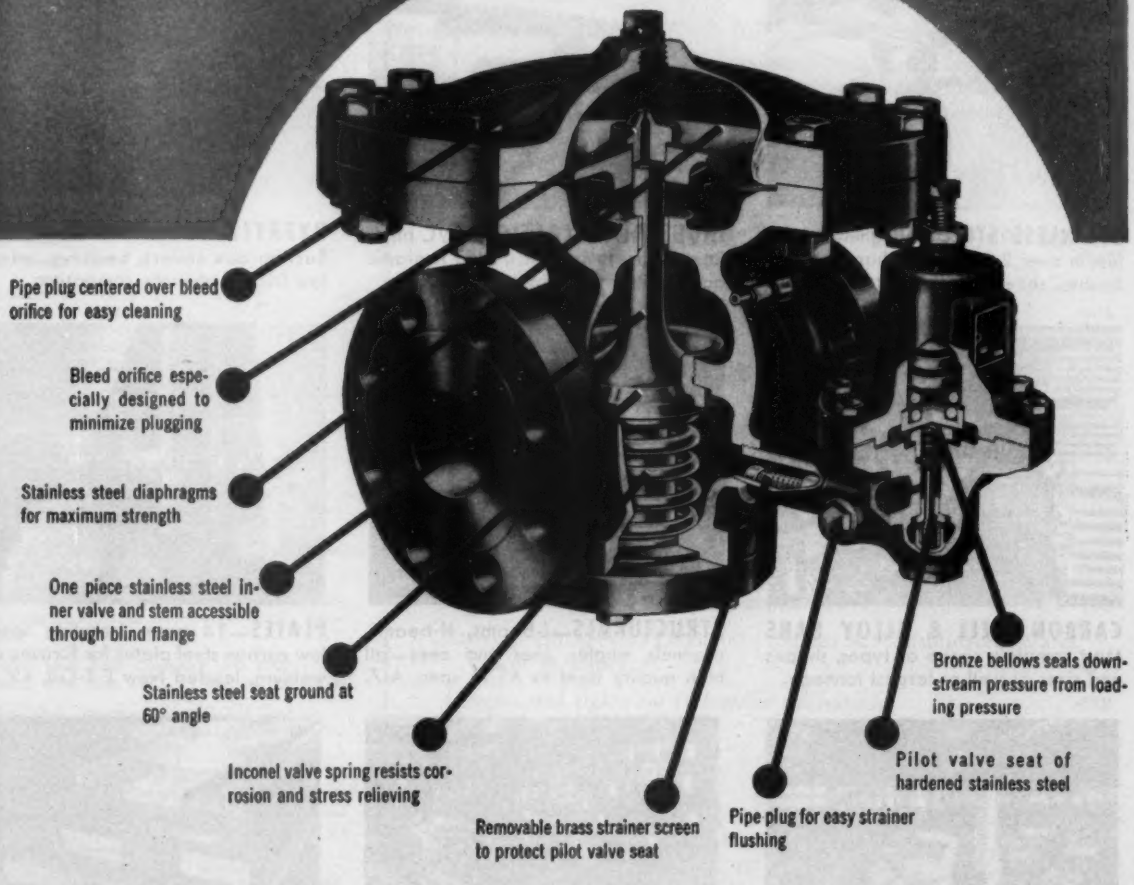
ASTEN Dryer Felts—Economy in the long run.

THE FISHER® 92B

IMPROVED

TO MINIMIZE PROBLEMS INHERENT IN STEAM SERVICE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Bleed orifice especially designed to minimize plugging
Stainless steel diaphragms for maximum strength
One piece stainless steel inner valve and stem accessible through blind flange
Stainless steel seat ground at 60° angle
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Removable brass strainer screen to protect pilot valve seat
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Bronze bellows seals downstream pressure from loading pressure

Not content with the enviable performance record of the Type 92A, Fisher engineers have improved this pilot operated pressure reducing valve to a new peak of performance.

For extremely accurate, long trouble-free service, put a Fisher 92B in the line. One pilot with three interchangeable springs provides a range of from 2 to 150 psi. • ***Send for Bulletin D-92 today.***

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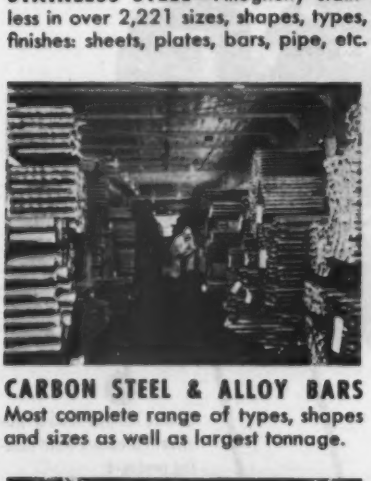
REPORT FROM RYERSON
on Services and Products in Stock

In addition to the products shown below, you can call on Ryerson for flame-cut steel shapes, fabricated steel for reinforced concrete or steel frame construction—many other products and services. And equally important are the specialists who carry out the Ryerson quality control program —see that customers specifications are *exactly* met, that every order is correctly filled and promptly delivered. As a result you get unequalled service and certified quality when your company calls Ryerson for steel, aluminum, industrial plastics and machinery.

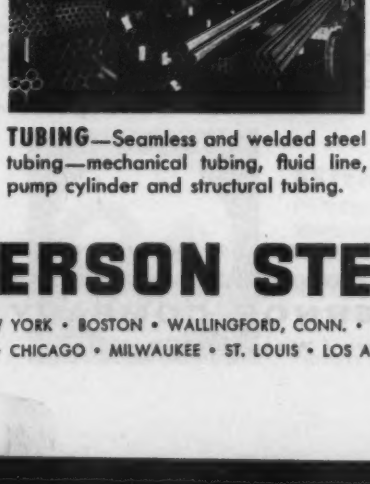


STAINLESS STEEL—Allegheny stainless in over 2,221 sizes, shapes, types, finishes: sheets, plates, bars, pipe, etc.

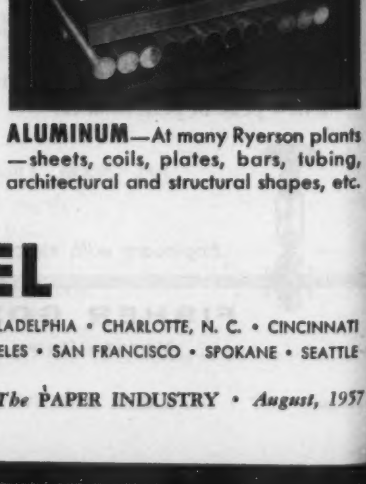
INDUSTRIAL PLASTICS—PVC pipe, fittings, sheets and rods, rigid Kralastic and flexible polyethylene pipe.

RYERTEX COVERS & BEARINGS Suction box covers, bearings, etc. of low friction phenolic compositon.

CARBON STEEL & ALLOY BARS Most complete range of types, shapes and sizes as well as largest tonnage.



STRUCTURALS—I-beams, H-beams, channels, angles, tees and zees—all high quality steel to ASTM spec. A-7.



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The Paper Industry

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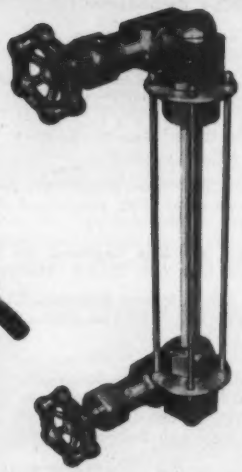
...more quality proved POWELL VALVES

FIG. 2309—Flush Bottom Tank Valve for 150 Pounds W.P.

FIG. 2491—Stainless Steel O.S.& Y. Gate Valve for 150 Pounds W.P.

FIG. 1886—Stainless Steel Liquid Level Gauge for 350 Pounds W.W.P. Offset pattern.

FIG. 2107—Stainless Steel "Y" Valve for 150 Pounds W.P.



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From our point of view . .

A new pace set by the West

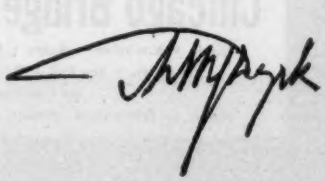
The paper and pulp industry in the West Coast area has set a rapid pace with its impressive new developments in recent years. Among the developments that have aroused nation- and world-wide attention are: (1) Crown Zellerbach Corp.'s pilot plant process for dimethyl sulfide recovery from waste liquor at Camas, Wash.; (2) Weyerhaeuser Timber Co.'s magnesium sulfite pulping and recovery method at Cosmopolis, Wash.; (3) Crown Zellerbach's production of "noodle pulp" at its Elk Falls mill on Vancouver Island, with subsequent transportation of this pulp in a specially developed tanker to the company's new mill located at Antioch, Cal., and (4) the operation at Hinton, Alta., of the world's largest—and North America's first—continuous pulp mill for the production of high-quality bleached sulfate pulp.

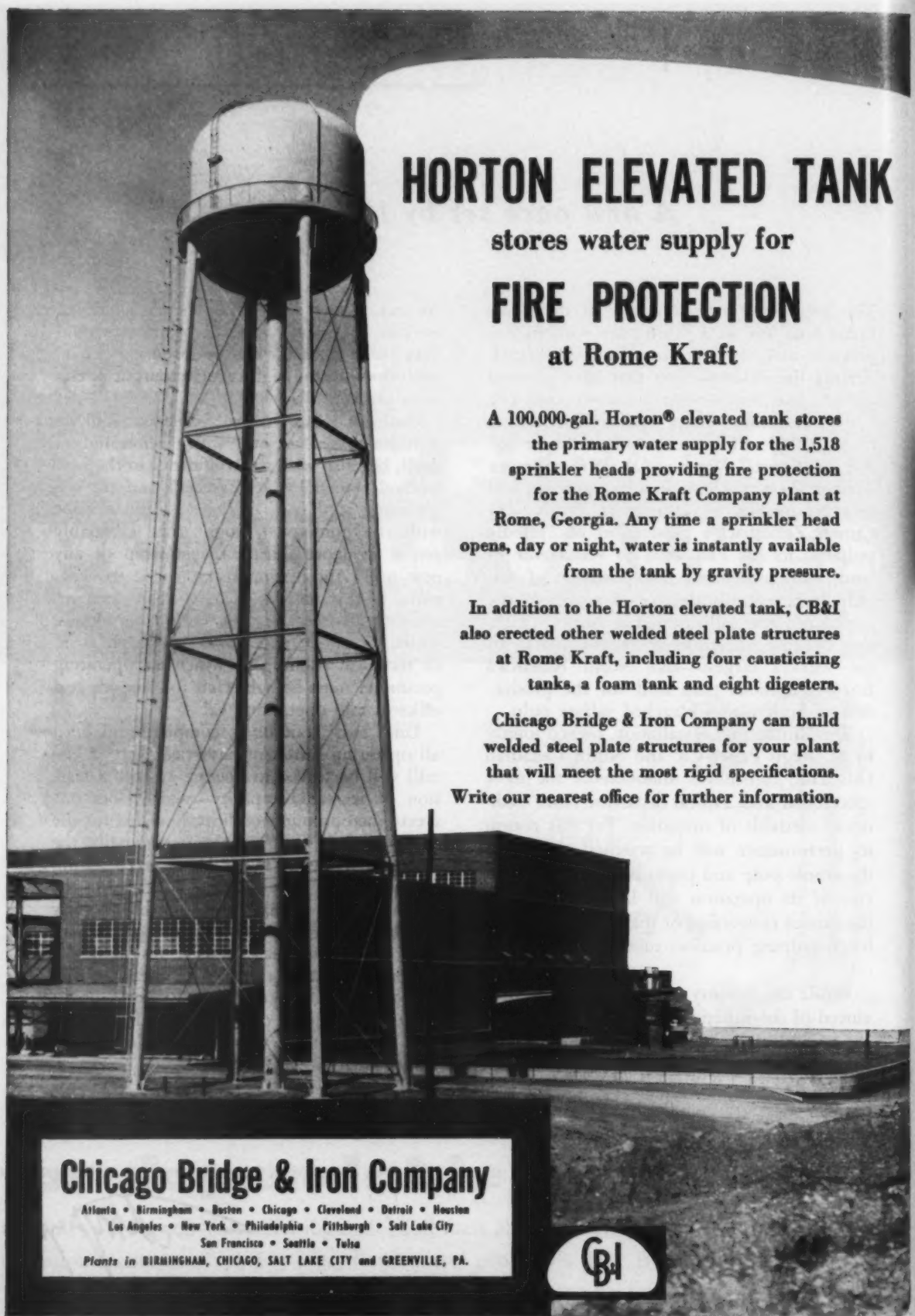
The Hinton mill installation, owned jointly by St. Regis Paper Co. and North Canadian Oils Ltd., constitutes undoubtedly the most spectacular and radical departure from traditional methods of operation. For this reason its performance will be watched closely by the whole pulp and paper industry. The success of its operation will largely determine the rate of conversion of the North American batch pulping practices to continuous methods.

While the industry as a whole is fully convinced of the superiority of continuous pulping over batch operations, there has been considerable reluctance in pioneering the introduction of such a system in chemical pulping on this continent, especially since it would have to be built on a scale large enough to conform with the high-capacity output operations practiced here.

During a recent visit to the Hinton mill we were impressed not only with the installation itself, but also with the confidence in the new method shown by management and the engineering staff, and in their ability to cope with the numerous "bugs" that invariably are in evidence during the start-up of any new mill. Automation seems to be the keyword in this mill, with more than 3000 instruments controlling the various processes, which in itself determines the high level of technical training to which all operating personnel must be subjected for smooth and efficient mill operation.

Until such training is complete and until all operating problems have been solved, the mill will be forced to operate at only a fraction of its rated capacity—which does not create the optimum conditions needed for the production of pulp of the best quality the company wishes to make. However, even under part-capacity operating conditions, the quality of the pulp now produced fully matches that of bleached sulfate pulp available on the market. There seems to be no doubt that, once capacity or near-capacity operation is reached, the company's objectives of producing the whitest and strongest pulp made anywhere in the world will be fully realized.





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stores water supply for

FIRE PROTECTION

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A 100,000-gal. Horton® elevated tank stores the primary water supply for the 1,518 sprinkler heads providing fire protection for the Rome Kraft Company plant at Rome, Georgia. Any time a sprinkler head opens, day or night, water is instantly available from the tank by gravity pressure.

In addition to the Horton elevated tank, CB&I also erected other welded steel plate structures at Rome Kraft, including four causticizing tanks, a foam tank and eight digesters.

Chicago Bridge & Iron Company can build welded steel plate structures for your plant that will meet the most rigid specifications. Write our nearest office for further information.

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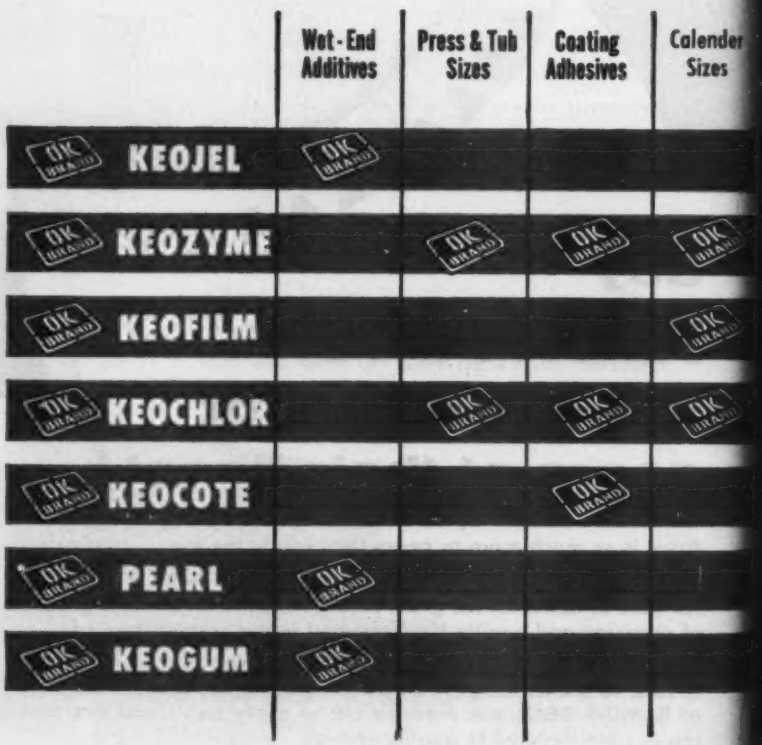

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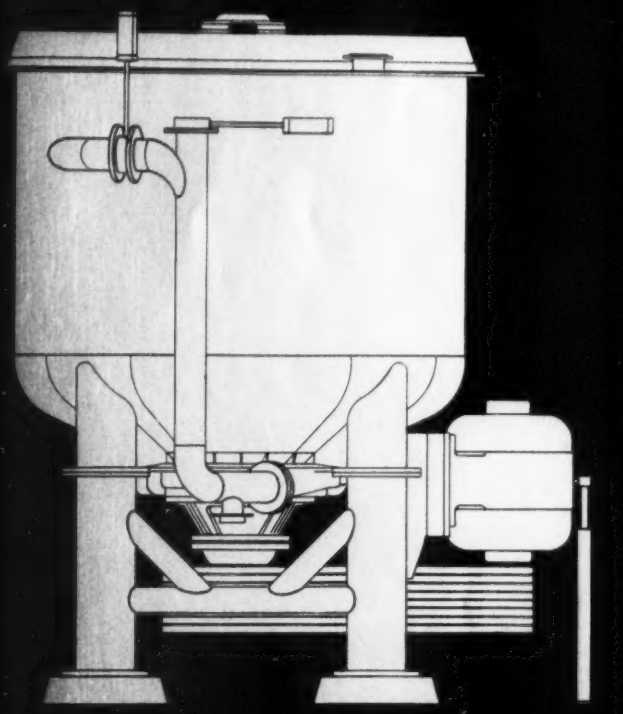

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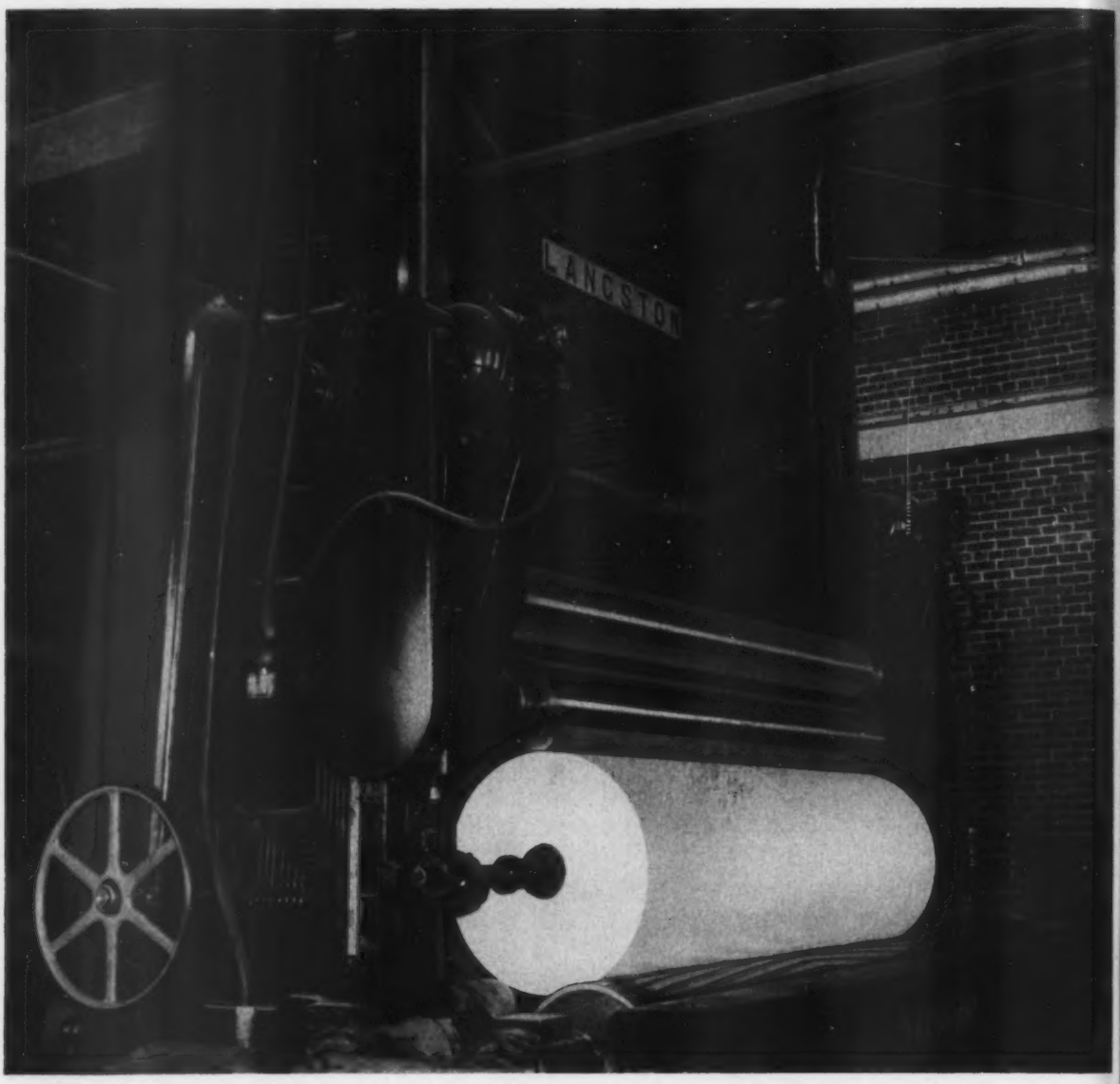

Langston Slitter and Winder features precision roll density control

Here's a way for you to get uniform roll density from the core to the outside. This type "DH" Slitter and Winder features hydraulic rider roll control that automatically adds or subtracts rider roll weight.

This arrangement makes it possible to constantly maintain correct nip pressure to compensate for the changing diameter and weight of the rewound roll. A simple valve permits setting the correct rider roll weight for various grades and basis weights of both paper and board.

Pushbuttons for raising and lowering the rider roll during threadup replace complicated chains, sprockets, and bulky counterweights, thus speeding up production by reducing setup time.

Learn more. Write SAMUEL M. LANGSTON Co., 6th & Jefferson Sts., Camden 4, N.J.

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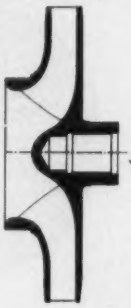
Ingersoll-Rand All-Purpose stock pumps

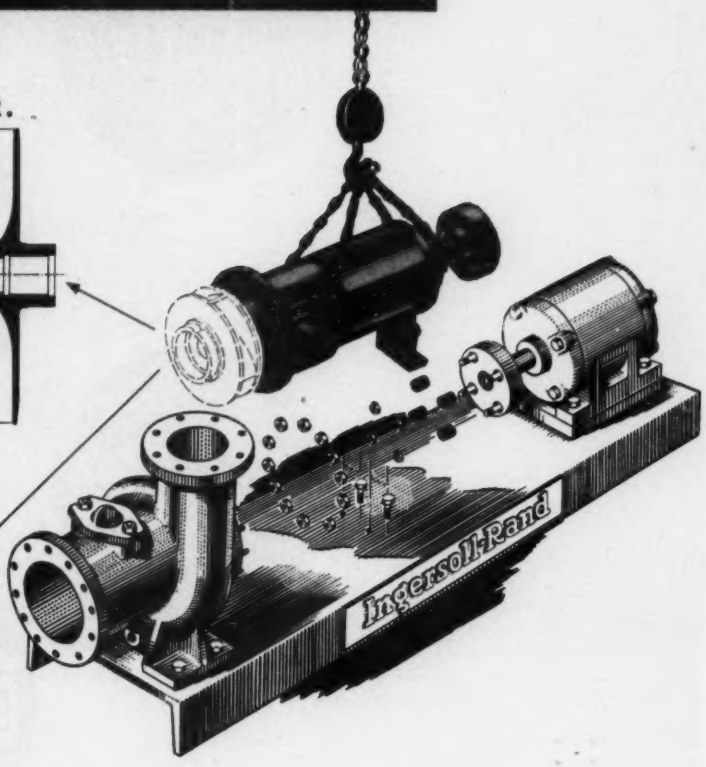
A. CONVENTIONAL IMPELLER.
For normal stocks up to 4% consistency

Note that the width decreases from center to periphery. For stocks with concentrations as high as four per cent, this impeller is the most suitable.



B. DIVERGING IMPELLER...
For high consistency or entrained-air stocks

Note how width *increases* from center to periphery. Material cannot enter fast enough to replace ejected material, and a vacuum forms between blades. Any entrained air or gases pass through the vacuum space without binding; solids and slurries pass through without abrupt acceleration.



You can switch this pump from normal to heaviest stock service...

simply by changing impellers and casing rings!

Here, for the first time, is a centrifugal pump which can be converted from handling normal stock (up to 4% consistency) to your heaviest stock... up to 10% consistency, containing large amounts of entrained air or gas. *All you do is switch impellers* and casing rings on the Ingersoll-Rand *All-Purpose* stock pump: The conventional impeller and the patented diverging impeller (see explanation above) are completely interchangeable.

All other parts are identical, which means you can cut your spare parts inventory at least in half ... because one basic pump can be adapted to handle any type stock. This gives you unprecedented flexibility in changing stocks and varying concentrations.

When you convert to the exclusive I-R diverging impeller, you have a pump which will not clog or vapor bind, which is self-venting and self-regulating. It will easily handle industrial liquids which other types of centrifugal pumps cannot handle.

Get complete details on the Ingersoll-Rand *All-Purpose* stock pump from your local I-R representative, or write direct.

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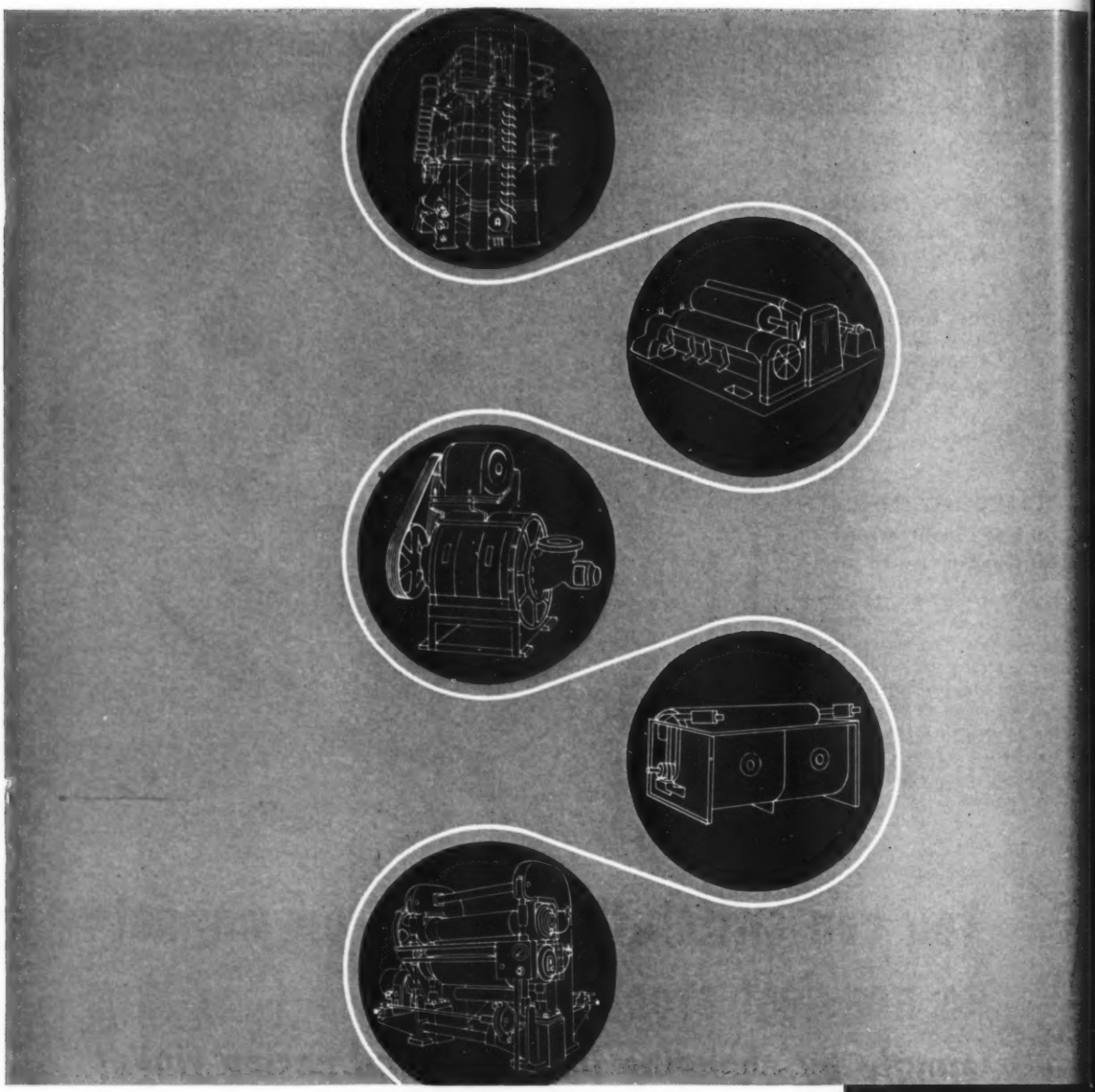

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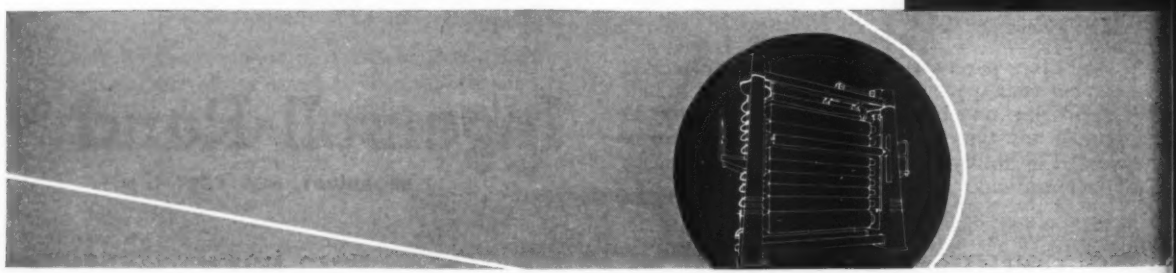

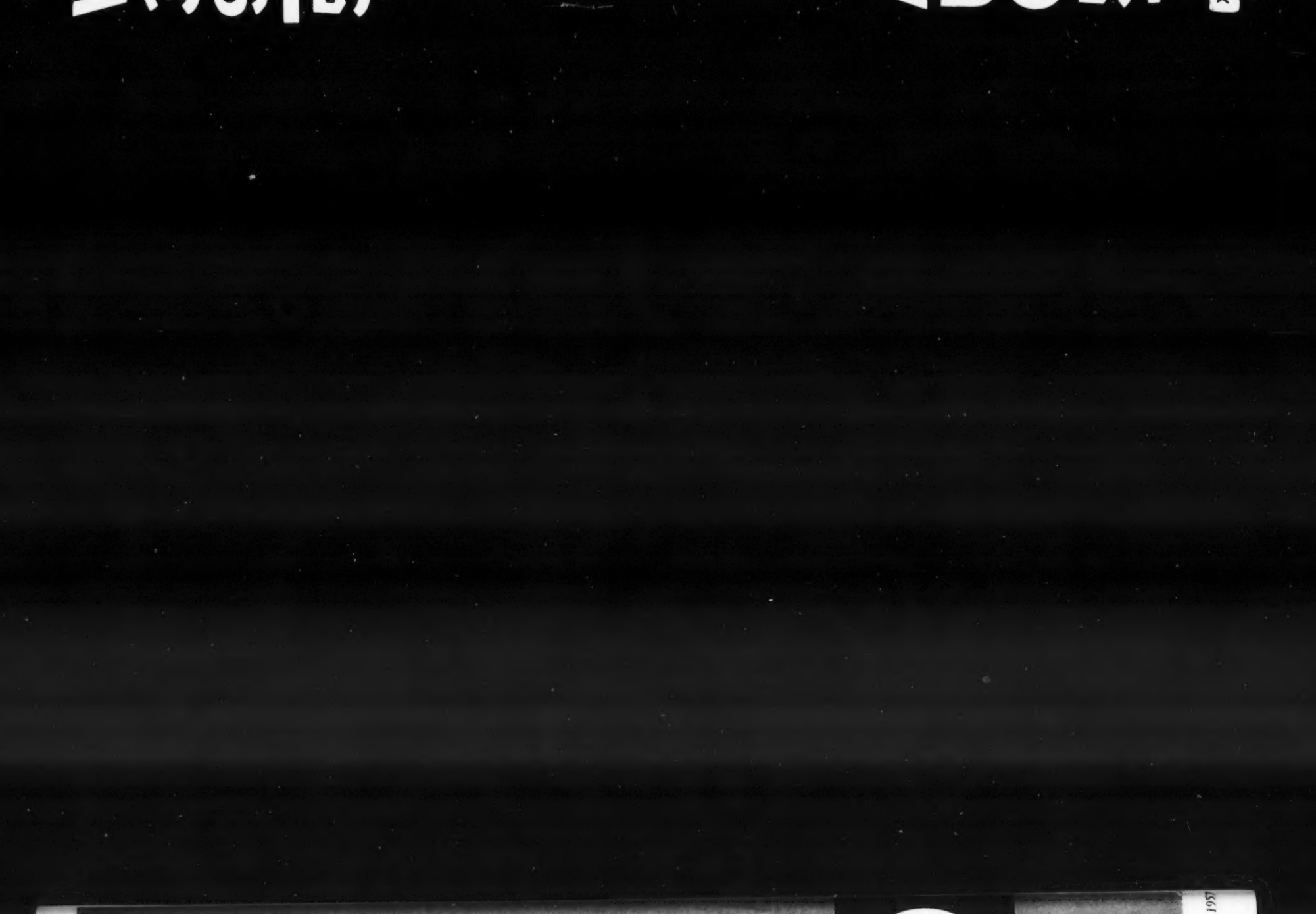

Jeffrey shredder on receiving platform of General Paper Stock Company, St. Louis, Missouri...

discharges chopped up cartons to Jeffrey belt conveyor for elevating to bins above balers.

chopping up 800 tons of telephone books is work, but this **JEFFREY SHREDDER** does it easily!

Twice a year the shredder pictured above chops up 800 tons of St. Louis telephone books—a tough test for any shredder, but this Jeffrey unit does it easily. And it handles its less spectacular daily task equally well.

Waste collection trucks back up to this portable belt conveyor, so that paper and cartons are fed almost directly into the hopper of this Jeffrey shredder. Seconds later it is chopped up and on its way to overhead storage bins. From there it is drawn off for baling.

General Paper Stock Company report these advantages: Chopped-up paper and cardboard produce higher density and more uniform, square bales. More tons in a carload, therefore. They also save on labor, since baling machines don't have to be filled by hand. Paper plants save on power and steam, since time in the beaters is reduced.

Catalog 855 describes these Jeffrey machines and recommends types for various requirements. For a copy, write The Jeffrey Manufacturing Company, Columbus 16, Ohio.

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Pittsfield, Massachusetts

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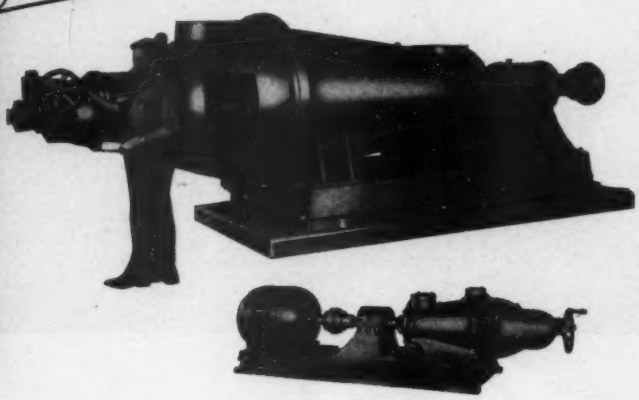


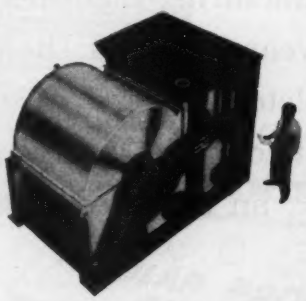
From the mighty Leviathan down to the Midget (for specialties and laboratory work) there is a Jones Jordan for every mill need. A wide variety of tackle, and a choice — on most models — of three types of plug adjustment mechanism, give Jones Jordans the maximum of control and flexibility. Ask your Jones representative or write us for Bulletin EDJ-1007A.

All Jones Jordans, for the past 15 years, have featured split small heads and self-contained bearings to permit quick and easy dismantling and assembly.

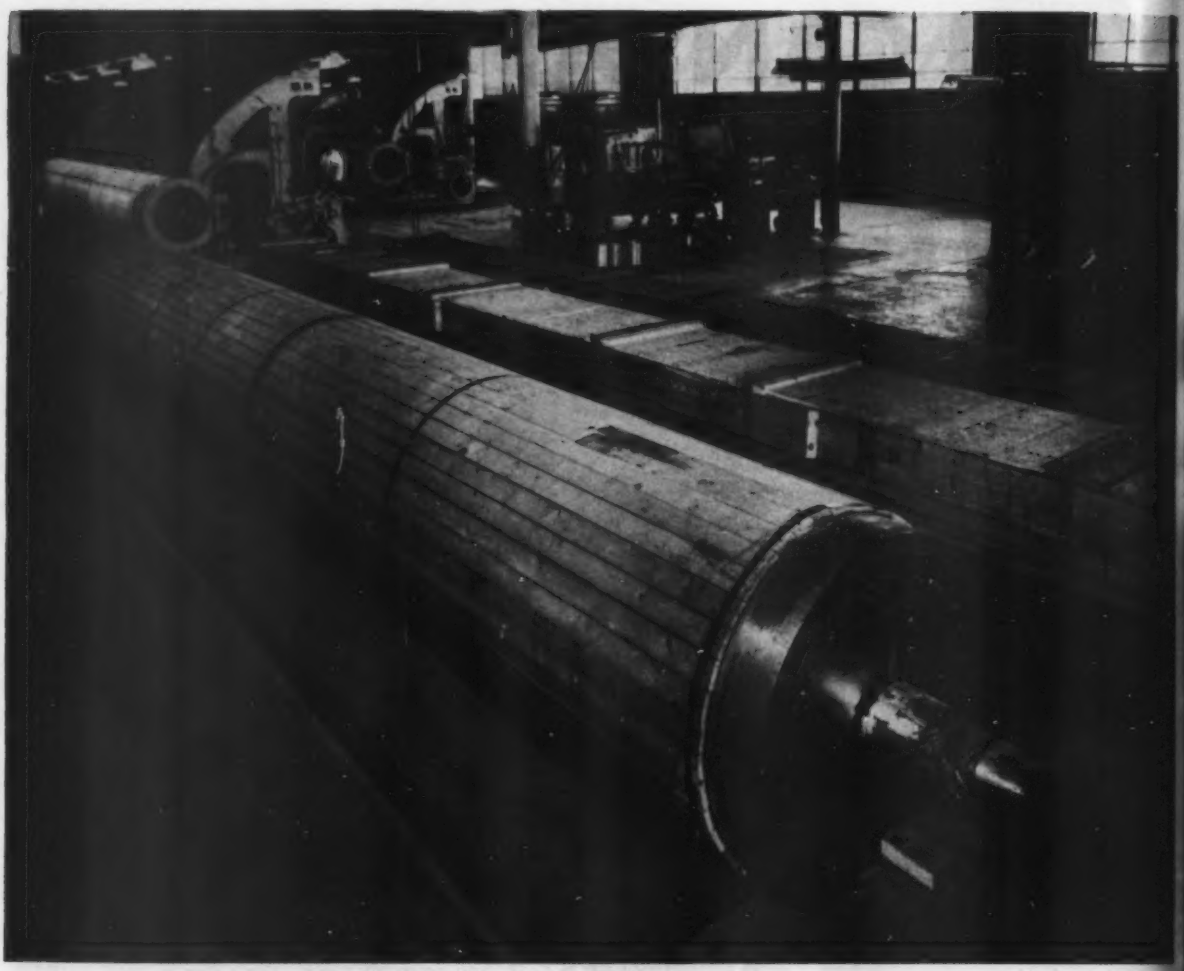
Jones HI-LO PULPER

Only individual rotors, one for circulating and one for defibering — the unique feature of this outstanding Jones machine — can provide fast, complete defibering, without cutting, and with the most efficient use of applied horsepower. The HI-LO is proving this in mill after mill, even on such hard-to-treat material as waste news and wet-strength broke. Ask your Jones representative for details or write for Bulletin EDJ-1063.

Jones BEATING UNITS



A complete "packaged" unit, incorporating proven principles of Jones-Bertrams design, affording precision control, more positive and uniform treatment of stock . . . and significant savings in installation, floor space, maintenance and power. Available for tub installation or multi-beater set-up for continuous operation. For more information write for Bulletin EDJ-1079.

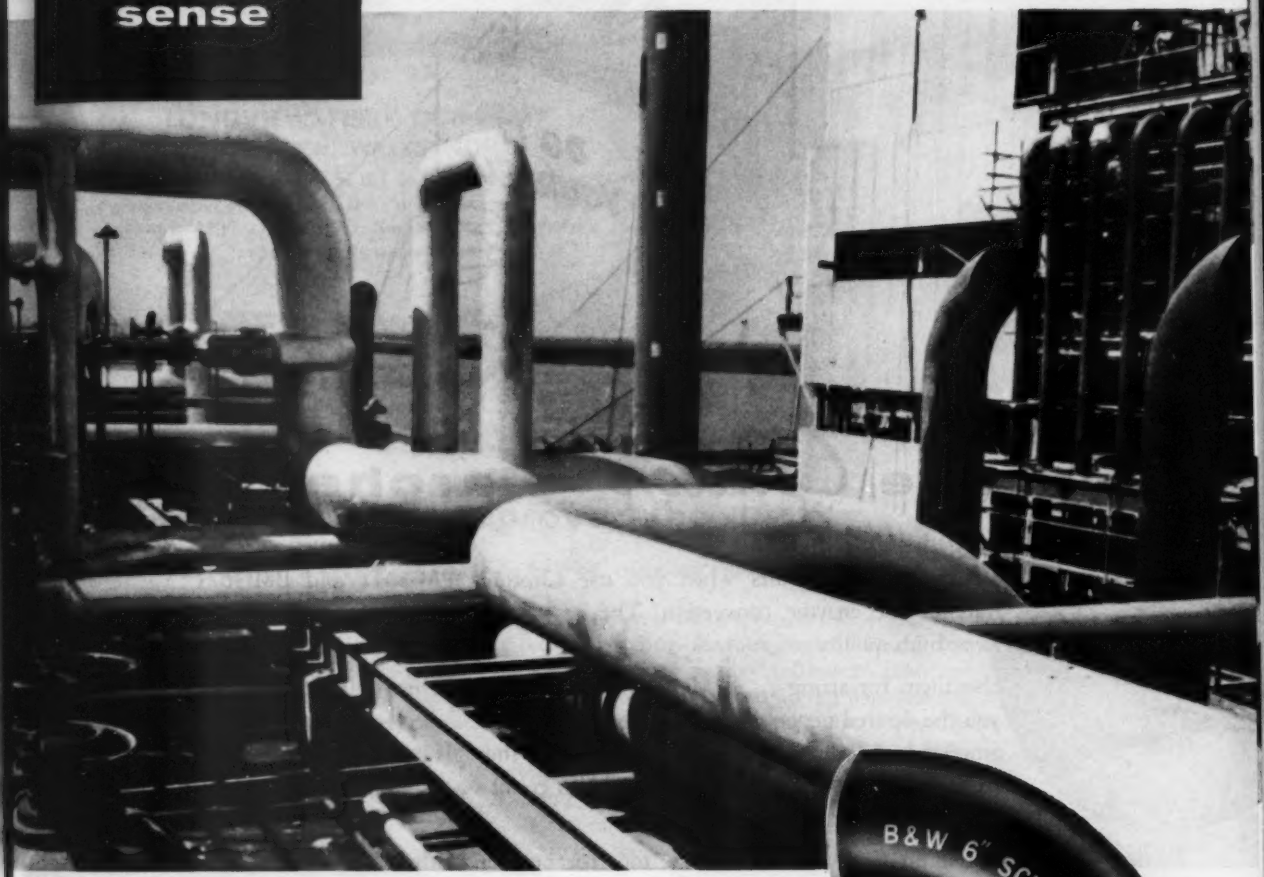


Six looms in the 290″ to 340″ size range are in operation at the Appleton Wire Works. Here, ready for erection, are crated rolls for the seventh — a 340″ loom scheduled for operation in September. The eighth loom in this size range will be installed and operating by the end of 1957. These are *new* manufacturing facilities provided by Appleton Wire Works in the past two years to meet the changing requirements of the paper industry. Appleton Wire Works, Inc. General Offices, Appleton, Wis. Plants at Appleton and Montgomery, Ala. International Wire Works, Menasha, Wis., an affiliated company.

APPLETON WIRES ARE GOOD WIRES

result of an engineer's good common sense

insulation is easier and faster to apply when seamless welding fittings are used



THANKS to the engineer who specified B&W Seamless Welding Fittings, no humps or bumps had to be insulated here. Welding fittings became an actual part of this smooth, streamlined piping. And with a sound weld, welded connections are leakproof, pipelines are permanent. Insulation never has to be restored because of leaky joints. Therefore, maintenance is practically non-existent.

Seamless Welding Fittings combine strength with lightness-in-weight and allow closer nesting. B&W's dimensional accuracy such as full radius, true circularity and smooth walls of uniform thickness permits uninterrupted flow even under highest temperatures and pressures.

Be sure — and specify B&W Seamless Welding Fittings and Forged Steel Flanges. They're available in a complete range of sizes and types in carbon steel and the B&W CROLOYS.

THE NATURAL SOURCE FOR ALLOY FITTINGS

B&W TUBULAR PRODUCTS DIVISION

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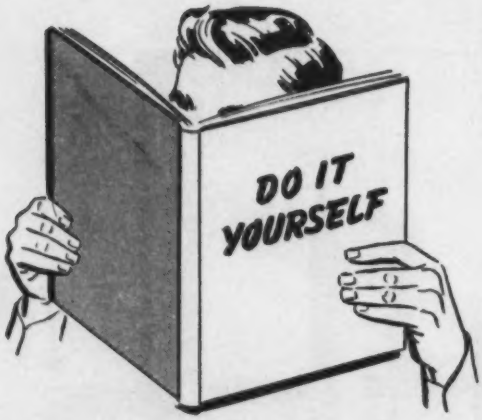
Seamless welding fittings and forged steel flanges, seamless and welded tubular products — in carbon, alloy and stainless steels.

converting your own starch?



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You'll like the results when you use Clinton's PM-3011 and PM-3021 starches for enzyme conversion. They're always uniform . . . always the *same* high quality.

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Our 50th Anniversary Year 1907-1957

LONGVIEW FIBRE COMPANY
LONGVIEW, WASHINGTON

Longview Fibre Company is the second largest integrated pulp and paper operation on the Pacific Coast. Production is close to 1200 tons per day. Seven Cameron winders are now in operation here.

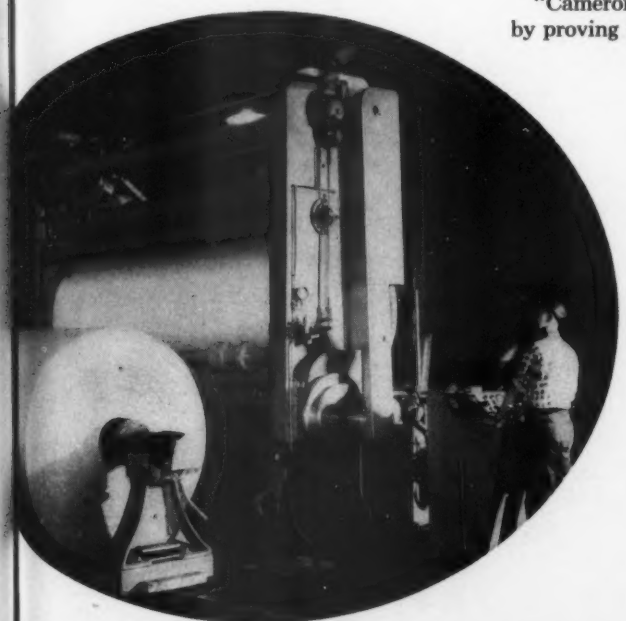
"CAMERON 468 improved the quality of our board rolls" —*says Rex L. West, Assistant Paper Mill Superintendent*

"The outstanding advantage of our new Cameron 468 Winder is its ability to make a good roll. Our 468 is rated at speeds which provide ample reserve for anticipated future expansion. However, speed is a secondary consideration. Of first importance to us is the quality of the rolls.

"The Cameron 468 serves our No. 4 machine directly, winding medium weight board for corrugating. Poor quality rolls were hampering production in our corrugating department. With the Cameron 468 we get tight, uniformly wound, straight-sided rolls that feed perfectly, saving time, trouble and money in the corrugating operation.

"Cameron winders have earned our respect by proving their ability to meet our demands."

Rex L. West



AT LONGVIEW a Cameron 468 high speed mill type winder serves the No. 4 machine on medium weight board. For ease of operation and to maintain constant, uniform roll quality, all hydraulic and electric controls are located in the panel board of the operator's control station.

Roll quality is of major importance wherever paper is made. Rolls produced on Cameron winders are uniformly wound to the precise required degree of *hardness* or *softness*. Straight sides, clean-cut edges and uniform density mean smoother feeding in subsequent operations. You'll save money and please your customers with Cameron-made rolls. At the same time, you'll find Cameron's reserve capacity a sound investment for future expansion. You are invited to consult with our technical staff on any slitting or roll winding problem.

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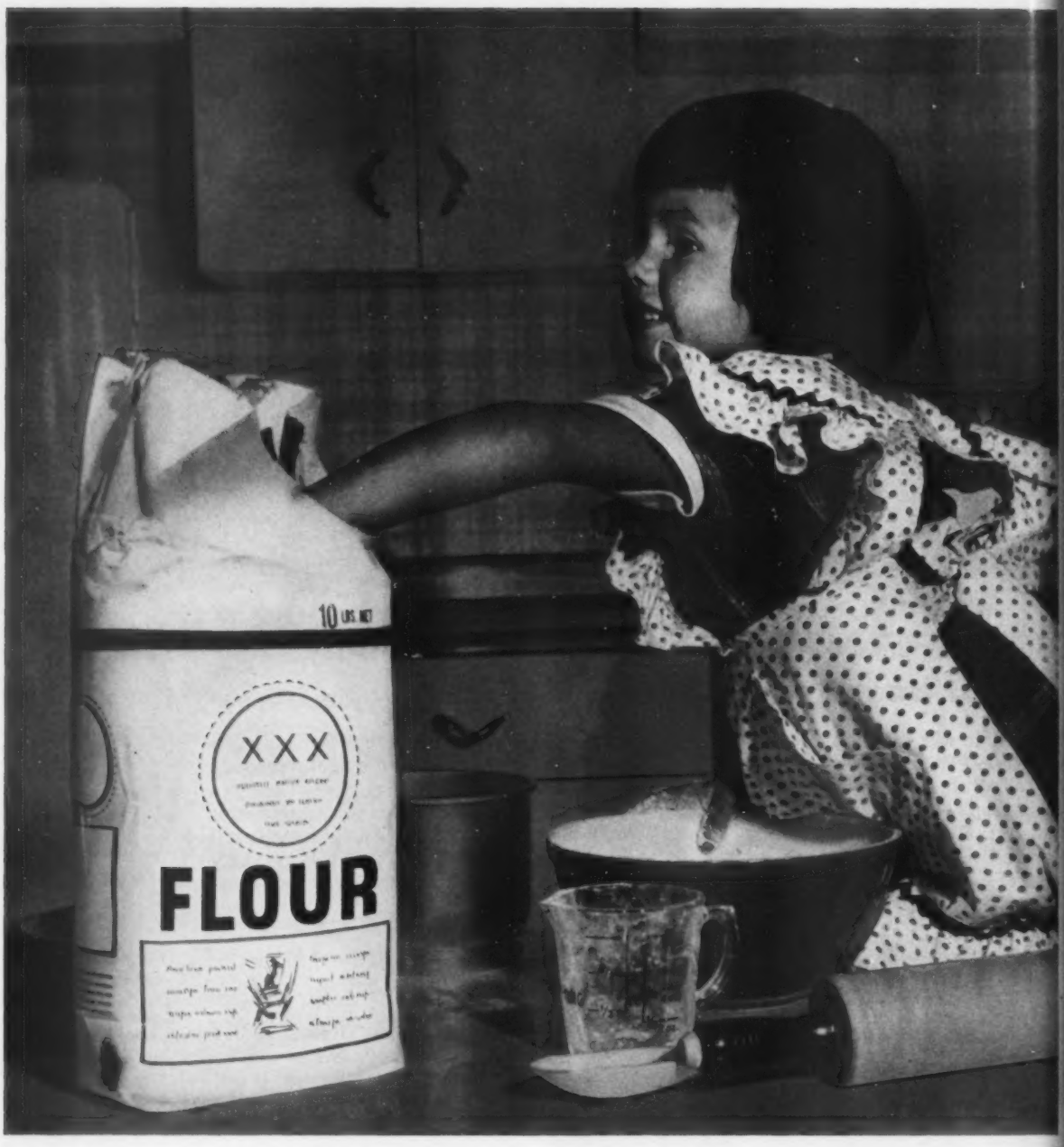

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While our young baker has the spirit, we don't guarantee the results. But we can guarantee that nothing surpasses TITANOX titanium dioxide white pigments for imparting the bright whiteness to paper that makes the flour bag a shining promise of purity within.

Not only for paper for white bags but for any type of paper that needs whitening, brightening and opacifying, TITANOX is No. 1 choice in white pigments. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y. Offices in principal cities.

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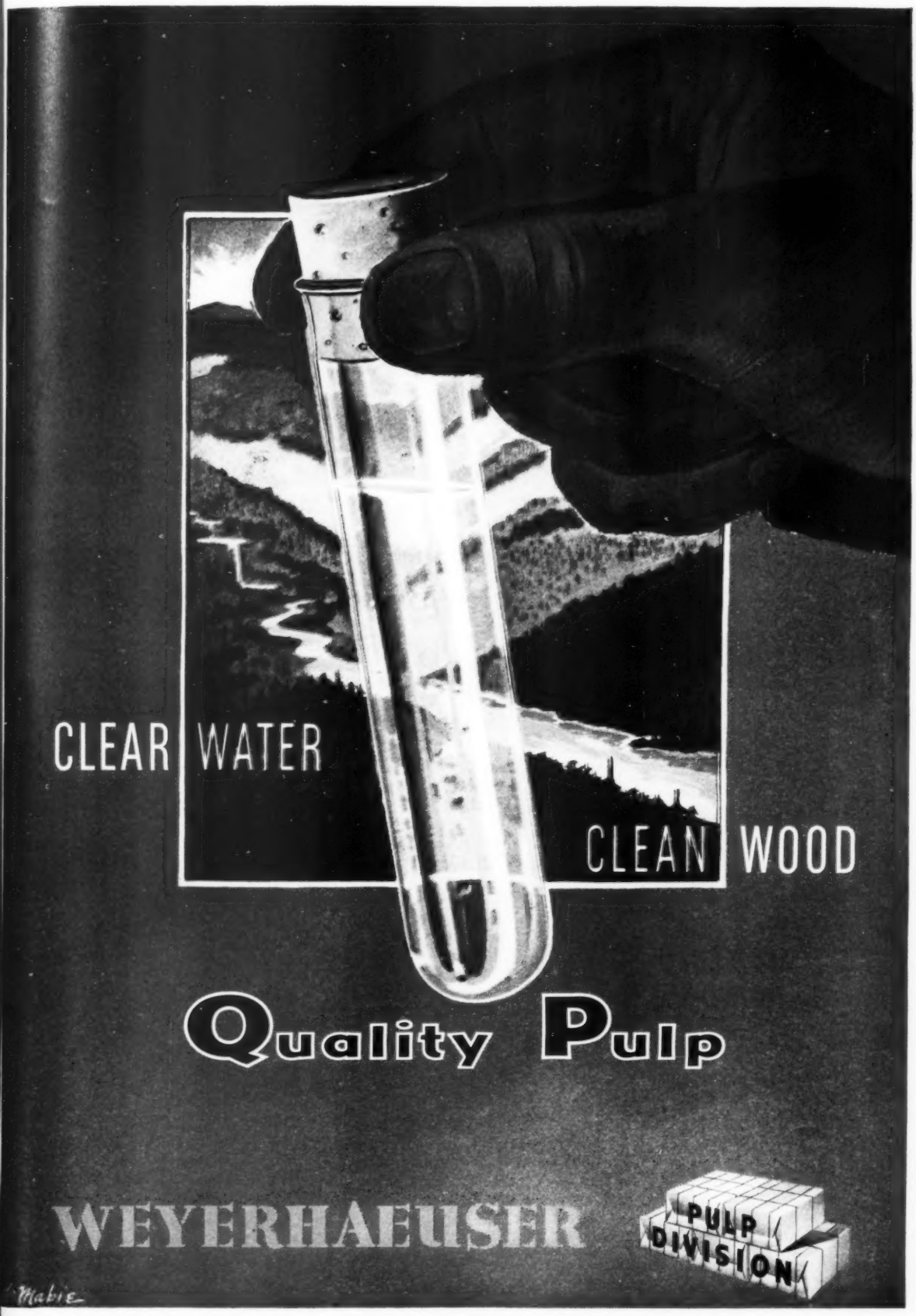
5208

1957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Feature articles

North Western Pulp & Power's continuous pulp mill in operation

Part II — Chemical recovery and liquor preparation, steam and power generation, water treatment plant and waste disposal

▶ The recovery furnace is designed to handle 1,400,000 lb. of dry solids per day; spray nozzles are located on all four walls of the furnace, which is equipped with a new type secondary air system for greater efficiency.

NORTH WESTERN PULP & Power Ltd.'s continuous pulping operation was described in the July issue. In the August issue are featured the mill's recovery system and power generation.

Chemical recovery and liquor preparation

Weak black liquor at 15 per cent solids is pumped from the oxidation towers to two 35-ft. diameter by 30-ft. (216,000 gal. each) feed liquor storage tanks. The weak black liquor is then pumped from the tanks by a 900-gpm pump to the evaporators.

The sextuple effect evaporator is equipped with six pumps, four being interstage black liquor transfer pumps, one a contaminated condensate pump and one a clean condensate pump. Plain tubes are used in Nos. 3, 4, 5 and 6 effects, while stainless steel tubes are used in Nos. 1 and 2 effects.

A mixed type of weak black liquor feeding is used. The liquor is fed into the fourth and fifth effects. From the fifth effect it flows into the sixth, and then liquor from the sixth effect joins incoming feed into the fourth. Then it goes to the third, second and first effects and two-stage flash tank successively. This type of feeding is designed to cut down liquor carry-over and increase overall efficiency. A pump transfers strong black liquor at the rate of 252 gpm from the second stage of the flash tank to two 22-ft. by 23-ft. 9-in. high (66,500 gal. each) storage tanks.

Steam enters the chest of the first effect, condenses, and the clean condensate is then flashed in a 42-in. by 8-ft. high (85 psi design pressure) flash tank. A pump transfers the clean condensate at the rate of 135 gpm to the deaerating heater in the power plant. The flash goes to the condensate drainage tube of the third effect.

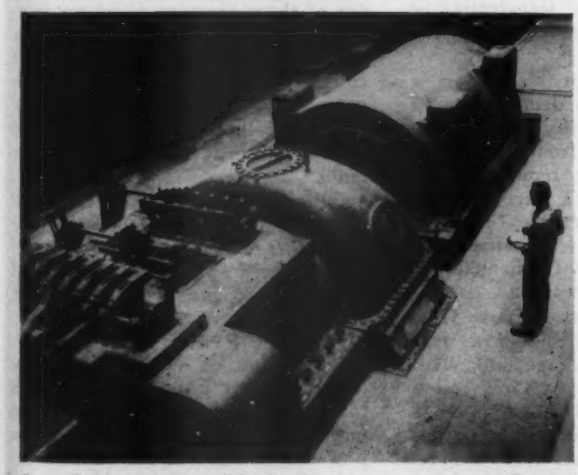
The vapor from one effect is used in the chest of the next. Condensate is collected in a common header and is pumped at the rate of 600 gpm to the causticizing hot water tank. Vapor from the sixth effect is pulled into a six-pass surface condenser at the rate of 62,000 lb. per hour. Filtered mill water enters the shell side of this condenser at 55°F and a rate of 2,800 gpm and leaves at 100°F to be used in the bleach plant. Stainless steel tubes are used to resist corrosive sulfur vapors that are present in the vapor leaving the last effect. A two-stage ejector system and a hogging ejector draw off any non-condensible vapors and help to create a vacuum in the sixth effect. Any water vapor that has not condensed in the surface condenser is condensed in a barometric condenser. The ejector systems and barometric condenser drain into a 5-ft. by 6-ft. high (885 gal.) seal

Combustion Engineering Inc. recovery furnace is capable of burning 1,400,000 lb. of dry solids per day.

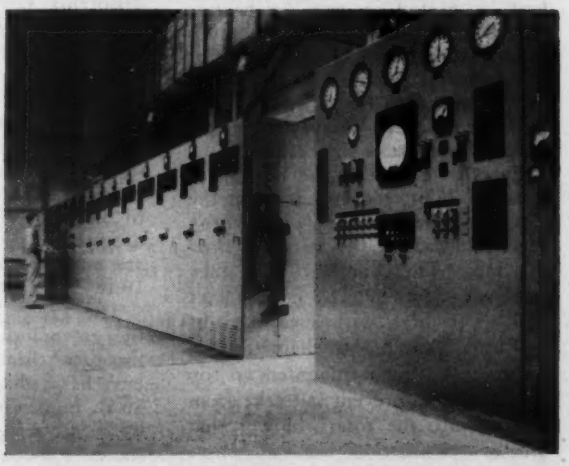
Platen superheaters in recovery furnace.

Left — Tangential air pipes in recovery furnace.

Right — One of the two Combustion Engineering cascade evaporators operating in series.



One of the two Foster Wheeler Corp. steam generators. The unit generates 175,000 lb. of steam per hour.



Control panel and Bailey Meter Co. instrumentation in the steam generator room.

tank that overflows to the sewer.

Liquor is transferred from the strong black liquor storage tanks by a pump at the rate of 224 gpm to the troughs of the dual chamber electrostatic precipitator. The precipitator, designed to handle 20,000 cfm of gas, is 34 ft. long, 40 ft. wide and 32 ft. high and is equipped with 20 vibrators for removing dust from the electrodes and perforated plates. A drag scraper at the bottom of each chamber scrapes the dust into the liquor flowing through the troughs. From the troughs, the liquor drops into a 7-ft. by 7-ft. diameter (2000 gal.) precipitator salt cake mixing tank.

A pump delivers liquor from the precipitator salt cake mix tank to the upper cascade evaporator at the rate of 224 gpm. The two cascade evaporators are the tubular type and are operated in series. Liquor at 50 per cent solids and 190°F enters the upper cascade and overflows to the bottom one. A pump recirculates at 300 gpm from the upper cascade to two chemical ash hoppers of the recovery furnace and boiler. Gases leave the cascades at 325°F and go to the precipitators.

Lumps or particles above ⅜-in. size are removed from the liquor leaving the lower cascade by a screen in the mechanical flow box. The screened liquor flows into a 5-ft. by 13-ft. high salt cake mixing tank. Salt cake is added to this tank, and the liquor is stirred by a mixer mounted on top of the mixing tank. Two 15-ft. diameter by 14-ft. dump tanks are used to drain the cascade evaporators in case of failure or shut-down. These dump tanks are provided with stainless steel steam coils to keep the liquor from solidifying, and a pump is provided to empty these tanks when necessary.

Liquor from the salt cake mixing tank is heated in two pre-heaters to 240°F. A pump is used to pump liquor from the primary heater, at 155 gpm and 68 per cent total solids, to the secondary heater and then to the burners. An Airveyor system unloads salt cake from box cars, delivers it to silos at the rate of 10 tons per hour, recovers it from the silos and delivers it to a 20-ton service bin above the salt cake mixing tank. There are two salt cake silos, which are 25 ft. in diameter and 40 ft. high with a capacity of 800 tons each. A 7-ft. diameter No. 6 Airveyor filter is mounted on top of the silos to prevent salt cake from getting into the rotary blower that creates the suction used to move the salt cake. When unloading salt cake, a flexible metal hose with a submersible nozzle on its end is inserted into the box car. The salt cake is drawn up into the filter, and it falls directly into the first silo, or it is carried by a 12-in. 30-ft. long Heliroid screw conveyor into the second silo.

When salt cake is being reclaimed it falls directly into a 24-in. by 18-in. Type "A" swing hammer pulverizer from No. 1 Silo and is conveyed by another 12-in. Heliroid screw conveyor from No. 2 silo. The salt cake is then carried to a 4-ft. diameter single-stage cyclone receiver mounted above the storage bin in the recovery section.

The recovery unit is designed to handle 1,400,000 lb. of dry solids per day. Ten spray nozzles located in all four walls are used for spraying black liquor into the furnace. Smelt runs into the dissolving tank below the unit through three water-cooled smelt spouts.

A No. 665 induced fan is used to draw gases at the rate of 168,000 cfm from the furnace into the cascade evaporators and then into the precipitators. A steam air heater is used to heat the draft air to the furnace to 300° F. This air is then blown to the primary and secondary air ports by a No. 593 forced draft fan at the rate of 75,100 cfm.

The smelt dissolving tank is 13.5 ft. high and 21 ft. in diameter (32,800 gal. capacity). The inside of the tank is lined with 4 in. of concrete to prevent corrosion. There are steam shatter nozzles at the end of each of the smelt spouts to break up the stream of smelt flowing into the tank. Weak wash is pumped from the causticizing section to the smelt dissolving tank at the rate of 400 gpm, and green liquor is formed. Two pumps are used for recirculating the green liquor in the smelt dissolving tank and transferring it to the green liquor clarifier at the rate of 400 gpm.

The green liquor clarifier is a steel tank 40 ft. in diameter by 15 ft. high and has only one compartment The dregs from the green liquor clarifier are removed by a mud pump through a valve assembly to an 8-ft. diameter by 7-ft. high dregs mixing tank, from where they are pumped to a 20-ft. diameter by 10-ft. high dregs washer.

The green liquor overflow from the green liquor clarifier flows into the green liquor storage tank. This tank has a diameter of 35 ft. and is 30 ft. high. Green liquor is pumped by a centrifugal pump to a lime slaker. Reburned lime from a 3170-cu. ft. lime silo is fed to the slaker by means of a screw conveyor controlled by a variable drive. The slurry from the slaker flows to three continuous causticizers of 15-ft. diameter and 10-ft. height and operating in series. A centrifugal pump then pumps the slurry to a white liquor clarifier, a four-compartment balanced-tray thickener, in which the calcium carbonate is settled and the white liquor removed continuously as overflow to the storage tank.

The lime mud from the white liquor clarifier is pumped by a No. 6 mud pump to a mud washer, which is a four-compartment thickener of the combination type and is 35 ft. in diameter and 25 ft. high. The washed mud is pumped by another No. 6 mud pump to a 20-ft diameter by 18-ft. high lime mud storage tank. It is then pumped to a 13-in. "ferris wheel" variable speed slurry feeder, which feeds it to a rotary drum filter. A Hytor vacuum pump, size L8 driven by a 75-hp motor, is used to provide a vacuum. Lime mud from the filter is fed by a screw conveyor to a 9-ft. diameter by 250-ft. long four-support rotary lime kiln equipped with a 35-ft. long 4-in. chain system and 8½ by 181½ Peabody scrubber. The kiln is driven by a 100-hp type H.S. induction motor coupled with a speed reducer. Natural gas is used to fire the kiln. The kiln flue gas is passed through an 18½-ft. by 8½-ft. kiln gas scrubber before passing out of the stack.

The reburned lime is carried by a drag chain lime conveyor to a lime bucket elevator that conveys it to the lime silo. The lime bucket elevator is 84 ft. 4 in. high and has a 7½-hp drive.

Clarified white liquor from the white liquor storage tank is treated further by passing it through the white liquor polishers, which consist of three pressure filters containing graded anthracite as a filter medium. These filters will remove colloidal material that cannot be removed by sedimentation methods. The white liquor then flows to one of two polished white liquor storage tanks.

All the storage tanks in the caustic room, with the exception of the mud storage tank, are 35 ft. in diameter, have a height of 30 ft. and a storage capacity of 28,900 cu. ft.

Steam and power

Generation of steam takes place in one recovery boiler fired with black liquor, one power boiler fired with natural gas and bark and one power boiler fired with natural gas only. Steam pressure and tempera-

Principal equipment at North Western Pulp & Power's new continuous pulp mill

Chemical recovery and liquor preparation

Airveyor system, for salt cake handling, 10 tons/hour capacity ..... Fuller Co.
Black liquor pumps (2), one 900 gpm and one 225 gpm ..... Worthington Corp.
Black liquor pump (1), 252 gpm ..... La Bour Co. Inc.
Cascade evaporators (2), operated in series ..... Combustion Engineering Inc.
Causticizers (3), continuous, 15-ft. diam. each ..... Dorr-Oliver Inc.
Condensate pumps (2), one 600 gpm and one 135 gpm ..... La Bour Co. Inc.
Dregs mixing tank, 8-ft. diam. ..... Dorr-Oliver Inc.
Dregs washer, 20-ft. diam. ..... Dorr-Oliver Inc.
Electrostatic precipitator (1), dual chamber type, 200,000 cfm ..... Koppers Co. Inc.
Evaporator system, sextuple effect, equipped with stainless steel tubes in first and second effects and plain steel tubes in third, fourth, fifth and sixth effects ..... Swensen Evaporator Co.
Evaporator system pumps (6) ..... La Bour Co. Inc.
Fans, draft, No. 665 with 168,000-cfm capacity and No. 593 with 75,100-cfm capacity ..... Canadian Sirocco Co. Ltd.
Feed liquor storage tanks (2), 216,000-gal. capacity each ..... Horton Steel Works Ltd.
Green liquor clarifier, 40-ft. diam. ..... Dorr-Oliver Inc.
Green liquor pumps (2), 400 gpm each on smelt-dissolving tank ..... Worthington (Canada) 1955 Ltd.
Lime kiln, 250-ft., driven by a 100-hp motor ..... Canadian Allis-Chalmers
Lime slaker, equipped with screw conveyor ..... Dorr-Oliver Inc.
Mixers (5), turbine type (four made of stainless steel), on lime slaking tank, causticizing tanks and dregs mixing tank ..... Greey Mixing Equipment Ltd.
Mixers (2), stainless steel, 25- and 7½-hp, on main dissolving tank and salt cake mixing tank ..... Greey Mixing Equipment Ltd.
Mud pumps (3), one No. 2 and two No. 6 ..... Dorr-Oliver Inc.
Mud washer, four-compartmented, 35-ft. diam. ..... Dorr-Oliver Inc.
Preheaters (2) ..... Combustion Engineering Inc.
Pressure filters (3), with anthracite filter medium .... Dorr-Oliver Inc.
Pumps (3), a 224-gpm pump from precipitator to cascade evaporator, one feeding the lime slaker, and one the white liquor clarifier ..... Worthington (Canada) 1955 Ltd.
Pump (1) 300-gpm from the cascade evaporator to the ash hoppers ..... DeLaval Steam Turbine Co.
Recovery furnace, with 10 spray nozzles located in all four walls, 1,400,000-lb/day of dry solids capacity ..... Combustion Engineering Inc.
Rotary blower for Airveyor system ..... Roots-Connersville Blower (Canada) Ltd.
Rotary drum filter ..... Dorr-Oliver Inc.
Salt cake pulverizer (1), 24- by 18-in. type A .... Jeffrey Mfg. Co. Ltd.
Screw conveyors (2), 12-in. Helicoid ..... Jeffrey Mfg. Co. Ltd.
Slurry feeder (1), "ferris wheel", 13-in., variable speed ..... Canadian Allis-Chalmers
Surface condenser, six-pass, 62,000-lb./hour capacity, equipped with stainless steel tube ..... Swenson Evaporator Co.
Vacuum pump (1), Hytor L8, driven by 75-hp motor, used on rotary drum filter ..... Nash Engineering Co.

Heating and ventilating system

Air exhaust systems (3) for removal of vapors ..... S. F. Products Canada Ltd.
Air supply units (4), two for machine room and two for pulping group ..... S. F. Products Canada Ltd.
Cooling systems for drive motors ..... S. F. Products Canada Ltd.
Ventilation system for oxidation towers .... S. F. Products Canada Ltd.

Steam and power

Ash-removing system, Nuveyor type, 12-tons/hour capacity ..... United Conveyor Corp.
Boiler water demineralizing unit, 660-gpm ..... Permutit Co.
Feed Water pumps (3), 1000-cpm ..... Byron Jackson of Canada Ltd.
Instruments ..... Bailey Meter Co.
KV breakers (5), interrupting capacity of 150 mva at 5 kv, for distribution of 2300-v power to high-voltage starters ..... Canadian Westinghouse Co. Ltd.
Mixers, portable ..... Greey Mixing Equipment Ltd.
Power boilers (2), 200,000-lb./hour steam capacity each, with forced and induced draft ..... Foster Wheeler Corp.
Power generator (1), 21,760-kw, hydrogen-cooled ..... General Electric Co.
Recovery boiler (1), 210,000 lb./hour of steam, 625 psi pressure, furnace equipped with secondary air system; superheater and screen section are of the platen type ..... Combustion Engineering Inc.
Surface condenser, 16,000-sq. ft. capacity ..... Foster Wheeler Corp.
Switchgear (14 cubicles), type M-36, rated 13.8 kv ..... Canadian General Electric Co. Ltd.
Transformers (7), 1,500-kva, 13,800/2300-v, 3-phase, 60-cycle, for power distribution to machine room, digester building, woodroom, powerhouse, and river pump house ..... Canadian Westinghouse Co. Ltd.
Transformers (13), 1500-kva, 13,800/575-v for low-voltage power distribution ..... Canadian Westinghouse Co. Ltd.
Turbine (1), for power generator, double-automatic extraction condensing unit, 20,000-kw ..... Canadian General Electric Co. Ltd.
Turbine governing system, for automatic and simultaneous maintenance of hp and LP extraction pressures ..... Canadian General Electric Co. Ltd.
Ventilation system for powerhouse ..... J. O. Ross Engineering Corp.

Pumping station and water treatment plant

Air compressor (1), driven by a 100-hp motor, used to compress flue gases ..... Canadian Ingersoll-Rand Co. Ltd.
Chemical feeders (2) for lime and alum ..... Wallace & Tiernan Inc.
Chlorinators (2) ..... Fischer & Porter Co.
Coagulating basins (12) ..... Northwest Filter Co.
Conveyor, 350-cfm capacity, for loading chemical feeders ..... Stephens-Adamson Mfg. Co.
Desludging valves (52), with 4-in. air cylinders and one master timer ..... Northwest Filter Co.
Influent water pumps (4), 7000 gpm each driven by 350-hp motors ..... Byron Jackson Co.
Instruments ..... Taylor Instrument Companies
Mixers (2), one Model 122-TEC-22 2-hp stainless steel turbine type for lime diluting tank; one Model 116-TEL-32 3-hp for lime slaker ..... Greey Mixing Equipment Ltd.
Pumps (6), 5000-gpm, for water supply to the mills from the clearwells ..... Byron Jackson Co.
Sand filters (6), 15,000,000-gpd total capacity .... Northwest Filter Co.
Sand filter pump (1), 12,000-gpm ..... Worthington Corp.
Settling basins (2), 1,450,000-gal. capacity ..... Northwest Filter Co.
Water treatment plant, 30,000,000 gpd capacity .... Northwest Filter Co.

General

Air Compressors ..... Canadian Ingersoll-Rand Co. Ltd.
Caustic cooler, two banks of shell and tube heat exchangers, for cooling concentrated caustic when diluted ..... Henry Vogt Machine Co.
Corrugated Transite, 315,000 sq. ft. ..... Canadian Johns-Manville Co. Ltd.
J-M Banrock blankets, 85% magnesia pipe covering and Superex pipe ..... Canadian Johns-Manville Co. Ltd.
Motors, electric ..... Canadian Westinghouse Co. Ltd.
Process tanks (32) ..... Horton Steel Works Ltd.
Pumps (20) ..... Canadian Allis-Chalmers
Pumps (40), centrifugal ..... Worthington (Canada) 1955 Ltd.
Rock cork, 2000 ft. ..... Canadian Johns-Manville Co. Ltd.
Structural steel ..... Dominion Bridge Co. Ltd.
Sulfur burner, equipped for steam atomization of sulfur, with automatic control valve ..... A. H. Lundberg Inc.
Thermobestos blocks, 75,000 sq. ft., 1½- and 2-in. ..... Canadian Johns-Manville Co. Ltd.
Thermobestos pipe covering, 30,000 lin. ft. ..... Canadian Johns-Manville Co. Ltd.
Transite pressure pipe, Class 100, with poured flanged couplings ..... Canadian Johns-Manville Co. Ltd.
Valves, butterfly ..... Fisher Governor Co.

ture conditions are 625 psi and 750°F.

The capacity of the recovery unit is 210,000 lb. of steam per hour at 625 psi pressure, while the power boilers generate 200,000 lb. per hour each. The furnace in the recovery boiler is equipped with a new type of secondary air system that produces more turbulence and burns the gases more quickly. The superheater and screen section are of the platen type to facilitate cleaning. The economizer is a vertical fin tube type with the gases making two passes across it. The control system is almost completely automatic.

The combination bark- and gas-fired boiler has pneumatic spreader stoker equipment for firing the bark and intertube gas burners built in the sides of the boilers. This boiler has forced draft and induced draft fans, which can be either turbine or electric driven.

The bark-burning boiler is equipped with sootblowers and pneumatic installation to reinject the partly burned fly ash into the furnace. Multiclones are installed under the air preheater to separate the particles of ash from the gases.

A Nuveyor ash-removing system is installed so that ashes can be pneumatically disposed into an ash-bin. The unit has a rated capacity of 12 tons of ash per hour and has a steam consumption of 200 lb. per ton of ash. The operation is dustless because of a closed pipeline system.

Feedwater is pumped by one of the three 1000-gpm feedwater pumps to the three boilers. Two of them are driven by 700-hp electric motors and one by a 600-hp turbine.

Electric power is generated in a 21,760-kw hydrogen-cooled generator at 13,800 v, driven by a double automatic extraction turbine operating at 600 psi and 750°F at the throttle and 1.5 in. Hg. abs. at the exhaust.

The turbine governing system will automatically and simultaneously maintain both high and low extraction pressures at the required settings, while the extraction steam flows and the kw output of the generator vary with demand.

The governing system also maintains the 60-cycle frequency at the same time it performs the above operations, as the unit is the only source of power for the plant apart from two gas engine generators for standby.

The governing system is of the oil relay type using a shaft-driven fly-ball governor and pilot valve to indicate speed and load changes and pressure governors for the hp and lp extraction controls. All the governing controls are contained within the front standard, and multiple cam-operated valves are used for the inlet, hp extraction and lp extraction valve gear.

The high voltage metalclad switchgear is Type M-36 gear rated 13.8 kv and consists of a total of 14 cubicles. Three cubicles are for the turbine generator unit, three cubicles for the two gas engine generator units and eight cubicles for feeder lines, including one to the townsite.

A total of seven 1500-kva 13800/2300-v, three-phase 60-cycle transformers distribute power to locations such as the machine room, digester building, woodroom, powerhouse and river pump house. These are outdoor type transformers with Sealedaire construction and with provision for future addition of forced air cooling equipment to increase the rating to 2000 kva. They are connected with delta primary and solidly grounded wye secondary.

Twelve 13800/575-v, 1500-kva transformers, similar in construction to the 2300-v units, supply a low-voltage ac to the various locations as noted above. A single 1500-kva 13800/575-v indoor self-ventilated dry type unit provides power to the recausticizing section of the mill.

The 2300-v power is distributed through 5-kv breakers to high-voltage starters located throughout the mill. These breakers are of the drawout air type, with an interrupting capacity of 150 mva at 5 kv and are enclosed in a metalclad structure. A total of seven two-cell structures were provided.

All motors, both synchronous and induction and rated 200 hp and below, are conected to the 575-v system. Those above are connected to the 2300-v system.

The extraction takes place at the fifth stage to the 180-lb. system, at the eighth stage to the 80-lb. header. Automatic extraction valves are installed to regulate the pressure at these stages.

The steam admitted to the turbine, and not taken off for extraction, goes through all the stages and is exhausted into the surface condenser having a surface of 16,000 sq. ft.

The full load figures at maximum extraction are:

119,000 lb. through 180-lb. extr.
366,000 lb. through 80-lb. extr.
15,000 lb. to the condenser

This of course can be adjusted to meet operating requirements.

Air is removed from the condenser by a two-stage air ejector and the condensate transferred by a 150-gpm condensate pump into a deaerating heater.

The cooling water pumps are able to pump 6,500 gpm of water through the condenser and are driven by 125-hp and 1175-rpm motors against a 45-ft. head pressure. The power supplied is 550 v.

The extraction steam from the turbine is discharged into a 24-in., 80-lb. header and into a 14-in., 180-lb. header. The steam used in the process is taken from these headers. The auxiliary turbine drives also exhaust into the 80-lb. header. In cases where condensate returns may become contaminated, a combustion sample cooler conductivity cell and quick-opening valves are installed so that, should the condensate become contaminated, it is automatically dumped to sewer.

According to its temperature and nature, the condensate returns to flash tanks or to the deaerating heater. Flash steam from the flash tanks is led to the treated water storage tank, into which the make-up of demineralized water is pumped.

The water from the treated water storage tank can be transferred to the deaerating heater by one electric- or one steam turbine-driven pump capable of discharging 600 gpm.

The deaerating heater receives steam from the 80-lb. header that will be reduced to about 35 psi. A low- and a high-temperature condensate connection is hooked into the top, and the heating steam enters from the side. Underneath this heater is a 19,000-gal. surge tank.

Water for desuperheating the 80- and 180-psi steam is taken off the side of the surge tank to avoid chemicals entering the steam, and the take-off for the boiler feed pumps is underneath. The sulfite is introduced into this suction line.

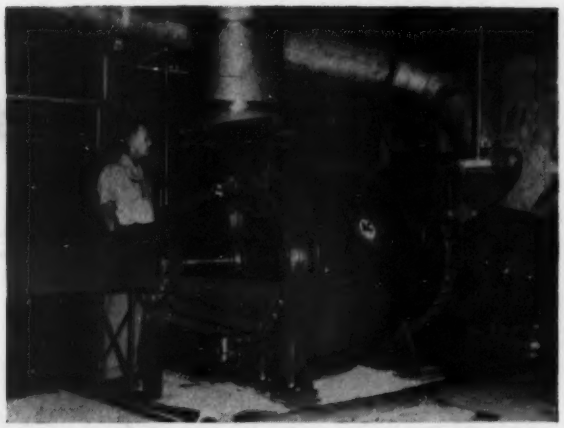
Boiler water treatment consists of a demineralization unit having a maximum capacity of 660 gpm.

Compressed air for the entire mill is supplied by five electric-driven air compressors. Two of these units have a total capacity of 1350 cfm compressed to 100 psi. This air is used as general mill compressed air. Two of the remaining compressors supply 65-psi air to the bleach plant, their total capacity being 1060 cfm. Instrument air is supplied by the fifth unit, which compresses 496 cfm to 100 psi. This air is filtered and dried immediately after compression.

(Continued on page 400)

Paper stock economically handled under variable capacity and head conditions

F. R. FORREST*



This ACAP fan pump on a kraft paper machine in a Florida paper mill delivers 30,000 gpm of 0.5-per cent consistency stock at 45-ft. head. The unit is driven by an Allis-Chalmers 400-hp 585-rpm induction motor.

HANDLING PAPER STOCK under variable capacity and head conditions is no longer a problem in paper mills where a variable capacity-variable head centrifugal pump with internal by-pass arrangement is being used to eliminate conventional valve arrangements.

Pulp and paper companies throughout the country, as well as in Europe, Mexico, Canada, and South Africa, are taking advantage of this pump's lower power needs, ease of control (either automatic or manual), cleaner and more dependable delivery, and excellent over-all job in many phases of stock handling.

This pump consists of an internal by-pass bolted directly to a re-machined single-suction centrifugal pump. Circular motion is used on the operating mechanism to change the clearance between a revolving impeller and a stationary wear plate cylinder, thereby controlling the flow from the discharge nozzle of the pump by by-passing fluid within the unit. The power requirement is from 40-50 per cent less than that needed for discharge valve control.

*Application engineer, Centrifugal Pump Dept., Allis-Chalmers Mfg. Co.

Where is the pump used

There are numerous paper mill applications where this pump is being advantageously used. For example, it is used to control the quantity of blow pit stock to liquid level in the washer vats. This is difficult to do by means of valve control because the blow pit stock contains uncooked knots and other material which tends to plug a partially closed valve. This pump affords automatic liquid-level control with freedom from plugging or dewatering of stock under any condition of operation.

The pump is also being successfully used to blend several stocks or to maintain constant recirculation. Here it provides delivery as low as 5 gpm without any tendency toward plugging or dewatering as may happen in automatic control valves.

It is also being used to supply stock to the machine stock head box because it eliminates the necessity for an over-flow line to hold a constant level in the box. Other successful applications for the pump are in

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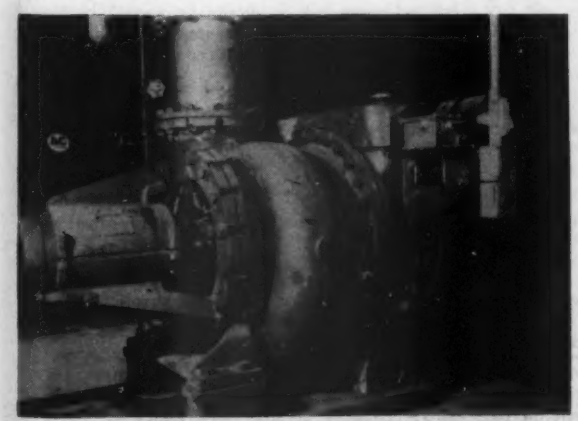


One of four ACAP pumps installed in an Alabama paper mill is rated at 10,000 gpm with a 10-ft. head. Serving as a fan pump, it takes the return white water from the wire pit, blends it with the make-up stock and returns it to the machine headbox.

This variable capacity-variable head centrifugal pump (ACAP) rated at 3200 gpm and 78-ft. head pumps fiberboard stock at 130°F at a Minnesota paper mill. Equipped with Texrope drive, the unit takes the final blended stock from the blender and pumps it onto the wire.

Replacement studies in a new light

B. A. MARGO
Consulting Management Engineer

A new replacement method makes a clear distinction between depreciation of existing assets and the accumulation of money needed for replacement.

NUMEROUS PIECES of machinery and equipment are replaced mainly because the new asset promises an interesting return on investment. What this return on investment might be can be determined in various ways, and there exists a substantial literature dealing with replacement studies. The method proposed in this article approaches the problem in a simple and unorthodox manner. It is of particular interest at a time of rising costs.

How does price inflation affect replacement?

If the purchasing power of the dollar were stable, the allowances for depreciation as laid down in Bulletin "F", Tables of Useful Lives of Depreciable Property (United States Treasury Department), would on the average suffice to earn the money needed for replacements. However, if the purchasing power of the dollar decreases steadily and substantially as we see it now, these allowances are not sufficient. Consequently, the difference has to be made up by taking money out of profits. Accordingly, the profits shown are fictitious, and the corporation income tax is too high.

If the trend of the dollar's purchasing power should reverse, the opposite would take effect. These are conditions that are most undesirable, and a great deal of thought has been given to means and ways of overcoming these difficulties that are part and parcel of our monetary system. One solution has been described in "Moneyless Bookkeeping", *Canadian Business* of March 1957. This method, which is in actual operation in several European companies, should give management and tax authorities a reliable picture of efficiency of operations and profits.

Actually, depreciation allowances have no logical connection with replacement problems, which is clearly shown by the following table. Replacement problems therefore deserve a special name for which the word "replaciation" is suggested.

Differences between Depreciation (D) and Replaciation (R)

Depreciation (D)	Replaciation (R)
Definition	
D. is (1) the act of lessening value or worth, as of property and (2) a fall in value.	R. is the anticipated cost of replacements, which should be earned by including appropriate amounts in the selling prices of products or services.
Applications	
D. shall take care of the diminishing value of certain assets, some of which are not replaceable.	R. is applicable to (1) all replaceable assets, (2) costing and pricing, (3) replacement studies and (4) financial budgets.
Time Factor	
D. has to do with money spent in the past.	R. has to do with money to be spent in the future.
Jurisdiction	
D. is under complete jurisdiction of tax authorities.	R. is under complete jurisdiction of management.
Limitation	**Freedom of action**
With some exceptions, D. is limited according to bulletin "F" mentioned above, which is based on past experience and makes no provision for changing purchasing power of the dollar nor rapidly changing technology.	R. can and should be adjusted at any time to any extent to suit anticipated changes of life expectancies of assets and purchasing power of the dollar.

How is replaciation calculated?

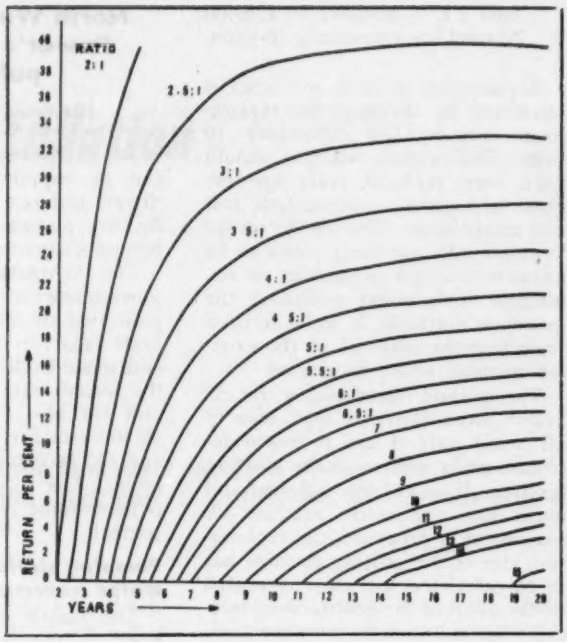
The calculation of a replaciation rate requires an estimate of the life expectancy of the asset and of the general level of prices which may prevail at the time of its disposal, further an estimate of its salvage value and of the price of a replacement in current dollars. This may be explained by an example:

If a mill in 1957 buys a pump for $3000 that may last 10 years, we may assume that a replacement would cost 15 per cent more because of certain improvements in construction. The salvage value may be 10 per cent; therefore, the mill has to accumulate $3450 by 1966 minus 10 per cent or $3100. (Because the assumptions cannot be 100 percent correct the calculation can be done with approximate figures). These are 1957 dollars. If we assume that the general level of prices in 1966 will be higher by 30 per cent, we have to multiply this amount by 1.3, which gives us an estimated replacement cost of $4000 (1966 dollars). The annual replaciation rate is therefore $400.

The calculation of a replaciation rate for an asset that has already been in operation for some time is very similar, as will be shown later on. Here it should be emphasized that such calculations are advisable even if the asset has been written off. We have seen already that the amount written off is in all likelihood not sufficient to buy a replacement. Even if it were sufficient, it may have been used for many other purposes. Actually, the only proof that money for a replacement was available is the replacement itself. In addition, it would create undesirable inconsistencies in costing and pricing if a replacement charge were dropped after expiration of the assumed life of an asset.

The replacement study in general terms

The method recommended consists of two steps. The first step is to find out whether the proposed new asset offers an attractive return on investment or not. If the answer is in the affirmative, the second step is to decide what to do with the existing asset. The mill management may decide to keep it in reserve or to dispose of it. In the latter case, its salvage value becomes interesting. This two-step method differs from other widely publicized methods, which assume immediately that the existing asset has a salvage value only.



Graph showing returns on investment.

To find out what the return on investment might be requires a comparison of operating costs.

The cost of operating the existing asset is or should be known within close limits; and an estimate as to how these costs may change during the rest of its life can be prepared with relatively little difficulty. Next an estimate of the operating cost pertaining to the new asset can be prepared. The difference between the two are the savings to be expected. In numerous instances it is fair to assume that such savings will remain equal annual amounts. With this assumption, the annual saving can be put in relation to the investment, and a ratio of investment to annual savings can be calculated. For this ratio and the assumed number of years during which the annual savings are expected, we find in the graph a return on investment.

The next question is whether the return on investment as shown in the graph is attractive or not. This depends upon the financial policy of the mill management.

If the annual savings should fluctuate and if the payments for the investment are spread over several years, a more elaborate method is needed.

Example of a replacement study

For the purpose of our discussion let us consider the following data, which of course are fictitious:

	Estimated Annual Cost	
	Existing Machine	Proposed Machine
Labor (incl. holidays, overtime, fringe benfits)	$14,000	$10,000
Maintenance (incl. overhead)	5,500	1,400
Power	500	1,000
Scrap loss	1,500	500
Property taxes and insurance	100	240
Replaciation	2,640	3,100
	$24,240	$16,240
Minus	16,240	
Estimated annual savings	$ 8,000	

Price of new machine $24,000 = Ratio 3
Est. annual savings $8,000 = Ratio 1

The return on the investment, taken from the graph, is 31 per cent, assuming the annual savings will be obtainable for 10 years.

Assumptions (on proposed machine):

1. Price $24,000 (1957 dollars)
2. Price of replacement in 1966 $31,000 (assuming an increase in the general price level of 30 per cent)
3. Life expectancy 10 years.

Assumptions (on existing machine):

1. Price $10,000 (1940 dollars)
2. Machine will be used until 1960 if purchase of replacement is postponed.
3. General price level will be higher by 10 per cent in 1960; therefore the price of replacement in

1960 1.1 × $24,000 = $26,000
4. Normal life expectancy 10 years.

Replaciation of both machines is calculated by dividing the replacement cost by life expectancy 10 years. The existing machine should have been replaced years ago because of excessive maintenance cost and scrap losses. The return on investment (31 per cent) seems to be attractive enough to consider an immediate replacement providing the money is available. If so, a decision regarding the disposal of the existing machine would be needed.

The method illustrated by the example given above is applicable in all detail only if the proposed replacement is similar to the existing machine. If an entirely different and much more expensive machine or equipment is proposed, the replaciation rate of the existing machine has to be calculated without any regard of the price of the proposed replacement. In such circumstances the money for the replacement has to be taken out of existing funds and cannot be earned anymore by the existing machine. Consequently, the replaciation rate of the existing machine would be based on the normal life expectancy of the existing machine and the estimated price of a replacement in kind.

Conclusion

The new replacement study makes a clear distinction between two entirely different purposes and conceptions: (1) the depreciation of existing assets that are partly non-replaceable and (2) the accumulation of money needed for replacements. This money is the anticipated cost of replacements, which in the ordinary course of business has to be earned by selling products or services. This distinction makes it possible to treat the problem of replacements without recourse to expressions which are normally familiar only to accountants, economists, analysts, etc.

The concept of replaciation puts the emphasis on cost of replacements as they may be anticipated in future, taking into consideration life expectancy and changing purchasing power of the dollar. It is absolutely flexible inasmuch as replaciation rates can be varied at anytime to any extent if it becomes apparent that the original assumptions have to be modified. This feature is of particular importance for safeguarding profits and capital during a period of rapid technological changes and diminishing purchasing power of the dollar.

North Western Pulp & Power's continuous pulp mill

(Continued from page 396)

For fire protection purposes water can be supplied by two turbine-driven and one electric-driven 250-hp fire pumps at 110-lb. pressure having a capacity of 2500 gpm each.

The ventilation system for the powerhouse is designed to supply preheated air required by the forced draft fans for the recovery furnace and steam boilers. The capacities of the forced draft fans are (1) 47,500 cfm for No. 1 power boiler, (2) 48,500 cfm for No. 2 power boiler and (3) 96,000 cfm for the recovery boiler. The supply air temperature is maintained constant by automatic control.

Pumping station and water treatment plant

The pumphouse is situated on the bank of the Athabasca River. At present it houses four influent water pumps of 7000 gpm driven by 350-hp motors. One of these pumps is a spare. Water flows to the water treatment plant through a 48-in. creosoted wood stave intake line that is approximately 4000 ft. long.

The water treatment plant is approximately 120 ft. wide and 368 ft. long. It has treating facilities for 30,000,000 gal. of water per day. The water is treated with chlorine, alum, caustic and milk of lime. After chemical treatment, the water enters twelve 19-ft. 8-in. by 19-ft. 4-in. by 20-ft. deep mixing and coagulating basins and passes through 38 venturi slots into two settling basins. These settling basins are 179 ft. long, 60 ft. wide and 18 ft. deep. Each basin holds a volume of 1,450,000 U. S. gal. of water. Continuous desludging is achieved by 52 desludging valves with 4-in. operating air cylinders and one master timer. After settling, the water is recarbonated using flue gas from the natural gas-fired power boiler. The flue gas is compressed by a compressor driven by a 100-hp motor. After recarbonation, part of the water goes to the filters for further treatment; the rest flows to the treated water clearwell, where it is pumped to the mill by three pumps with a capacity of 5000 gpm each.

The water that passes through the filters is stored in the filtered water clearwell and is also pumped to the mill by three pumps of 5000 gpm. There are six sand filters each 50 ft. long by 14 ft. wide filled with graded sand having a total capacity of 15,000,000 gal. per day. The wash water is supplied by a vertical deep well pump having a capacity of 12,000 gpm. An automatic back wash system has been provided for the filters.

Chlorinators are used to chlorinate all water. Two emergency dry chemical feeders for lime addition and a dry alum feeder are also provided. A 48-ft. 8-in. conveyor having a capacity of 350 cu. ft. per minute is used to load the dry feeders.

Waste disposal

The waste disposal system consists of three out-falls. The general sewer takes high-b.o.d. waste water, also containing solids that can be settled out, from the drains in all departments. The caustic sewer handles the wastes from the two caustic stages of the bleach plant. The acid sewer handles the wastes from the other four stages.

The general sewer enters a pond, having a retention time of 72 hrs. at a flow of 8500 gpm, which is 1820 ft. long, 520 ft. wide and 5 ft. deep. The sewer is also equipped with a gate so that the pond may be by-passed for cleaning purposes. The pond effluent flows over a wooden weir and down a rock bed to the river. The rock bed helps aerate the waste.

All sewers flow through Parshall measuring flumes down a rock-bed trench joining with the pond effluent.

All the underground sewer piping is vitrified pipe. The acid sewer piping in the bleach plant is fiber glass-reinforced polyester. The caustic sewer is stainless steel.

Paper stock handling

(Continued from page 397)

instances where a constant pressure is required on a bank of refiners, and for fan service where the delivered quantity requirements are variable depending upon the weight of sheet formation. Since the fan pump acts as a blending device as well as a machine head box supply unit, this pump gives extremely good blending of return white water and the make-up stock.

Whatever the application, the pump simplifies control either automatically or manually, with a resultant saving in power. In addition, in many instances, by making possible the elimination of conventional valving, it affords greater cleanliness.

Pipeline planning and installation

LEO WALTER
Consulting Engineer

▶ The first question in a plant survey is whether the pipe size is right for the actual load; correct positioning of valves is also of major importance.

THE NUMBER of pipelines in a pulp and paper mill carrying steam, water and other liquids or gas and compressed air for processing purposes is usually considerable. Correct piping of fluids is, therefore, just as important for plant efficiency as any other piece of plant equipment, and pipework has to be properly planned, correctly installed and periodically inspected and maintained.

What is called "preventive maintenance" applies to piping systems in order to keep them in good working order. Where piping extensions may have been added during the years in a haphazard way, overload of mains results. In other instances piping maintenance is either neglected or only performed when something has broken down. This state of affairs will reflect itself ultimately in a high maintenance bill, in reduced or irregular output and in general dissatisfaction. It does not necessarily follow that in a plant all the deficiencies are present; but, if one or the other weaknesses of the piping system can be amended, better working conditions will result. The following recommendations are flexible. No hard-and-fast ruling can be given because working conditions vary from plant to plant. First installation cost plays its part and often limits achievements for improvement.

Piping systems can be classified according to the fluid they convey or in view of the purpose they serve. Distance, volume, pressure and corrosive qualities of the piped fluid allow for sub-classifications. Materials conveyed can be compressible, such as air, gases or steam; or they can be incompressible liquids. A piping system can cover a small area or can be extended over many square miles. The fluid can be conveyed under high pressure or can flow under low pressure. Volumes handled vary in practice, and so do pipe sizes and types of fittings for shut-off or for throttling duties.

The over-riding factor is, however, the purpose that the piping system serves. It may be a hot water distribution system or a cooling-water system for an I.C. engine with an extended layout. Heating or cooling systems, compressed air systems and steam distribution mains for process work all require careful planning and maintenance and suffer from patch work.

Pipe sizing of steam pipes

It is not intended here to go into the intricacies of pipe sizing, which can be found in textbooks, but rather to suggest a plan for achieving improvements. The first question in a plant survey is whether the pipe size is right for the actual load, and this should be ascertained by rate-of-flow measurements. The use of a portable steam meter is invaluable in steam distribution systems. Oversized steam pipes cause unnecessary heat losses. An oversized piping system also requires bigger maintenance costs. The first step for improvement is, therefore, a very careful checking of pipe sizes throughout the plant, ascertaining what fluid velocities are present and comparison with standard figures.

Many a surprise will result from these measurements. What should be realized is that a threaded boss or a flanged connection on plant equipment does not indicate the correct pipe size, which has to be found by calculation. It is not proposed to discuss correct pipe sizing further, since it is a practical science in itself.

Efficient design of piping

The layout of piping in a new plant is usually placed in the hands of experts. The design of extensions in an existing works may be performed by specialists, but more often than not patchwork methods are applied in connection with piping installations to additional plant equipment.

Any alteration in plant layout can affect piping. For example, steam pipes may be left in place after a piece of plant equipment has been scrapped, with just a leaky shut-off valve at the end, thus contributing to heat loss; or the number of machines may be doubled and still be connected to the existing steam mains, with consequent bigger pressure loss and consequent steam starvation.

Correct positioning of valves in pipelines is another point that is much too often treated as of minor importance. Bearing in mind that inaccessible or less accessible valves are difficult to service, or even to operate in case of emergency, wrong positioning of valves has often accounted for trouble. Any reorganization of piping has to locate valves, steam traps or instruments where they are easily accessible and serviceable. Going around a plant with eyes open for the accessibility of auxiliary piping equipment often discloses to the progressive engineer many peculiar abnormalities, and a

(Continued on page 405)

Some of the more recent uses of chemicals in the manufacture of wood pulp

Part II — Digester wetting agents

▷ By lowering the surface tension of the acid liquor, wetting agents could effect a quicker penetration of the liquor into the chips.

WARREN BEAZLEY*

THE TWO PRINCIPAL processes in use today for the production of chemical pulp from wood are the kraft process and the sulfite process. The kraft process is an alkaline one employing sodium hydroxide and sodium sulfide, while the sulfite process is an acid one normally using a solution of calcium bisulfite in sulfurous acid.

Over and above the widely differing pH of these processes is the great difference in cooking time, the kraft process requiring 2-3½ hours and the sulfite process 6-9 hours for the completion of the cook. The principal reason for this great difference in cooking time is the difficulty of getting the sulfite cooking acid in intimate contact with the wood.

It is well known that alkaline solutions swell cellulosic material. Once swollen, diffusion processes take place rapidly, and the pulping chemicals can penetrate the inner portions of wood chips from all three structural directions: longitudinal, radial and transverse.

Sulfite cooking acid on the other hand, having a low pH, cannot swell cellulosic material. The only avenue of penetration is through the naturally occurring channels, which extend almost entirely in a longitudinal direction. These are the same channels that conduct the sap and other fluids that are present in the original tree.

Thus it is that the penetration of sulfite acid into wood chips is a relatively slow process. And since we must have intimate contact between the pulping chemicals and the wood to insure uniform cooking action, we must wait until the chips are well impregnated by acid before we reach cooking temperatures.

This would seem, then, an ideal place to use a wetting agent. If by using a wetting agent we could lower the surface tension of the acid so that it would penetrate the wood more quickly and more uniformly, a number of desirable results would have been achieved: (1) the cooking time would be shortened, thereby allowing an increase in production, and (2) pulping action would be more uniform, resulting in less tailings, higher pulp yield and a lower degree of cellulose degradation. There is the further possibility that subsequent washing of the pulp would be improved, that bleach demand would be lowered, and that pitch and resin problems would be lessened.

In spite of these benefits that should result from a successful digester wetting agent, very little attention has been given to this seemingly important point. True, numerous wetting agents have been suggested for this particular application. However, most have failed to produce the desired results.

Actually, the problem is not quite as simple as it would seem at first sight. First, the material must be soluble in the sulfite cooking acid. Further, it must be stable at a pH as low as about 1.8; its calcium salt (if one forms) must be soluble since calcium base sulfite liquor contains about 1 per cent lime as CaO; the compound must be stable at temperatures as high as 147°. And lastly, of course, the cost of the wetting agent must be commensurate with the benefits that the mill will derive from its use.

While these requirements may sound like an impossible set of specifications, recent results seem to indicate that at least some of the obstacles are being overcome. There are at least two products on the market, sold under the names of "Nacconols" and "Petro P," which have been tried in several mills with reportedly some success. These wetting agents are alkyl aryl sodium sulfonates.

U. S. Patent No. 2743179 assigned to Socony Mobile Oil Co. Inc. discloses the use of an alkali metal alkyl aryl sulfonate in combination with an aromatic petroleum fraction. The claims made for this chemical are decreased cooking time and a cleaner high-quality pulp.

While countless wetting agents now on the market show no significant benefits when used as digester additives, there is no doubt that some day some chemical company will make a killing in this field.

*Manager of pulp pilot plants and pulp development for Industrial Cellulose Research Ltd., Hawkesbury, Ont.

Better communications with word magic

JACK BEDFORD

▶ Words work wonders to help paper mill supervisors get things done—if their meaning is clear, positive, specific and non-argumentative.

TO GET THINGS DONE in a paper mill requires some means of communication. The vehicle to carry the message may be a notice on the bulletin board, an announcement over the public address system, a written report or a personal conversation.

Regardless of how the message is delivered, the employee communication must be completed with words. How successful we are in getting people to do the things we want will depend on our choice of words... word magic.

Here are some words and phrases that paper mill supervisors have found most helpful in building better employee communications...word magic that gets things done:

When

Positive thoughts are expressed in positive words, and positive thoughts get things done.

Consider, for instance, these two requests made by a paper mill supervisor:

"If you get time, do this....."

"When you get time, do this....."

Except for the change of one word these two requests are exactly the same. But, the change of one word changes it from a negative to a posing word. It makes it easy for the employee to procrastinate. Things are put off rather than getting done.

"If" is a weak, wavering, vacillatitive request.

"When," on the other hand, is a strong, stimulating, positive word. It gets things done quickly and with a minimum of friction.

Yet, because the request is prefaced by "when", it is not a command that will arouse the resentment of the employee.

Instead, it gives the employee a choice of *when* he will perform the task, not *if* he will do it or not.

To apply this word magic in your employee relations, you will need to do two things:

1. Think positive thoughts about getting the work done.
2. Preface your work request with "when" instead of "if".

Another way paper mill supervisors use the word magic of "when" to get things done is by asking a question. The employee is given a choice in the question which starts with the word magic "when".

For instance, you might want an employee to do something as soon as possible. You would ask,

"When can you do this—today or tomorrow?"

This assumes the employee will perform the task. It has the positive approach. And it gives the employee a feeling of importance because he can make a decision of doing the work today or tomorrow.

As this question is phrased, there is a good chance that the assigned task will be done tomorrow. But, if there is an urgency about getting it done today, you could change the order of the choice in your question. For instance,

"When can you do this—tomorrow or today?"

You put emphasis on the time you want the work done by placing it as the second choice. This is the last thing the employee hears and chances are good that he will give you the answer you want:

"Today."

You can use other choice words in addition to when. Some of the most effective of these prefacing remarks start with the magic words "which," "what", "where", "how", and "when". Any of these words will key your question to give the employee a choice between two things.

Another thought to keep in mind about using this word magic in question form is to make the choice between something and something . . . not between something and nothing.

For instance, asking the employee when he can do the work leaves the answer wide open to time. But, when the choice is nailed down to the choice between today and tomorrow, the employee will answer with one of these choices.

"When" is word magic that gets things done!

For example

One of the most important parts of a mill supervisor's management function is training employees. This on-the-job training takes on added emphasis for the employees when you employ word magic in the instructions you communicate to them.

"For example" is basic word magic in training. We use it all the time. We all learn through illustrations of the right and the wrong way to do things. And, since we are so conscious of this learning method, we are alert for examples that will help us understand better.

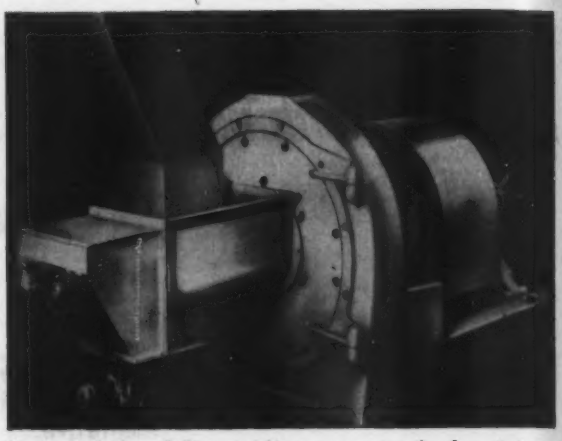
When you preface your instructions with the words, "For example", you snap the employee being trained to attention for your illustration. He is eager to learn how it is done and listens to your example.

In using this word magic, you will want to consider a few rules. First, the example you use should be given to prove your point. You make your point and then follow it up with the word magic, "For example".

Second, you want your example to be specific. You will make it more interesting and more memorable to the employee you are training when you use specific terms.

(Continued on page 405)

New drying and baling system for pulp



Bauer single-disc fluffing machine prepares pulp for airstream handling.

A NEW, highly economical system of drying and baling pulp for shipment has been announced by the Bauer Bros. Co. of Springfield, Ohio.

According to a company spokesman, the new system offers economic and production advantages that may make present methods of pulp marketing obsolete. The system can be used with a wide variety of pulp and is adaptable to the specific requirements of individual mills. The basic steps in the system are:

1. Pulp is dewatered by conventional means, such as by a vacuum decker, to an approximate range of 14-17 per cent solids and then shredded.
2. Pulp is reduced to 40-50 per cent solids content in a conventional screw press or roll press.
3. A Bauer single-disc or double-disc mill, or a hammermill, fluffs the pulp, enabling it to be carried by an air stream through the following operations.
4. Drying, in a three-pass revolving pulp dryer. This produces pulp dried to the optimum degree, with up to 75-95 per cent of the water removed.
5. Dried pulp, still carried by the air stream, is fed into a high-density baling press producing bales measuring 2 by 2 by 4 ft. and weighing 700 to 800 lb. depending upon shipping requirements.

Lower handling and shipping costs

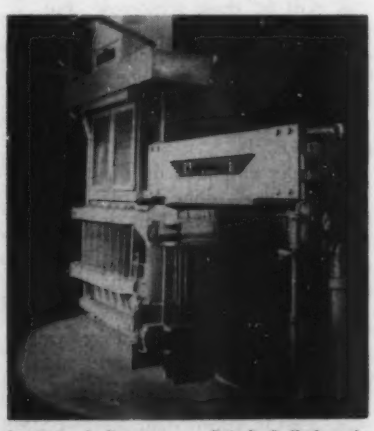
Pulp prepared in this manner, it was pointed out, will be far less costly to ship because of its low moisture content. With previous methods, the pulp being shipped contained anywhere from 40-60 per cent water, which meant both shipper and ultimate user were suffering unwanted shipping expense. In addition to reduced shipping costs, the low moisture content of Bauer-Bale Pulp measurably reduces the tendency for microbiological deterioration.

The convenient sizes of the bales streamline handling, storage and shipping. Bales can be moved easily with hand dollies, fork lift trucks or trolley conveyor systems, depending upon individual requirements. One automatic baling press produces approximately 15 bales per hour. The high-density bales need no strapping or wrapping prior to shipment.

Equipment in the system

After preliminary moisture reduction in conventional equipment (deckers, screw press or roll press) the pulp is fluffed. This can be done

Discharge end of Heil pulp dryer, automatically controlled to within 2°F. The unit requires only 1 min. to air-dry pulp.



Lummus baling press. Dried fluffed pulp enters at the left. When "box" is full, it rotates to compression side of press (door shown open), where it is subjected to tremendous pressure.

Bale of pulp ready for shipment. Bales will withstand rough treatment, can be shipped with or without straps.

in a Bauer single-disc or double-disc mill, with the single-disc mill getting the preference.

The heated air stream of a direct-fired, three-pass rotating drum dryer completes the drying operation. Manufactured by the Heil Co., Milwaukee, the pulp dryer is heated by a combination gas-oil fuel system of high efficiency. It is controlled automatically to maintain temperatures within 2° F. Because of the air stream handling system, pulp is carried through the dryer in direct proportion to its size and weight, based on moisture content. Total exposure time to the hot drying air is less than 1 min., and the pulp itself never exceeds a temperature of 130° F at discharge, eliminating any possibilities of surface hardness.

The high-density baling press, manufactured by Lummus Cotton Gin Co., Columbus, Ga., operates with a platen pressure of more than 1,333,000 lb., producing bale density in the range of 45-60 lb. per cu. in. Bales can be wrapped, strapped or palletized, or they can be shipped unwrapped and unstrapped.

Repulping is easy

Repulping of bales is quick, taking less than 5 min. in conventional pulpers. After slight beating or refining, normal or above normal burst and tear values are obtained.

Tests indicate the system works well with unbleached kraft, bleached kraft, unbleached semichemical and groundwood types of pulp. In groundwood there is a very slight drop in brightness—from a brightness of 66 to that of 64 per cent. Tests are continuing, and Bauer has facilities for evaluating runs on pulp from interested mills.

Costs of system

Estimated cost of installing the Bauer-Bale Pulp system averages approximately $1500 per daily ton capacity. Considering normal rates for fuel, labor, power, bale ties or wraps, the direct cost per ton of end product will run about $4.25. As the system is automatic, very little labor is required for its operation.

A single unit can be installed to handle from 50 to 150 tons per day. Large tonnage requirements can be handled by putting in additional dryers and baling presses. An installation producing 150 tons per day requires about 2000 sq. ft. with 30-ft. head room. Housing can be of the minimum type, and the dryer can be used outdoors where climate conditions allow.

The low initial cost of the system, its simplicity of installation and operation and its low operating costs are features that should benefit both integrated and unintegrated mills.

Pipeline planning

(Continued from page 401)

special regular yearly survey seems worthwhile.

Pipe identification

Preventive maintenance of piping is made easier by using the well-known standard color scheme for identification. A thorough knowledge of pipework details is also encouraged by keeping available an up-to-date layout drawing and up-to-date notes regarding alterations and extensions. The small and medium-sized plant is worse off in this respect than the larger plant, the latter generally having its own drawing office and maintenance department. There is, however, no need for even a small plant to be without correct up-to-date piping drawings, which can be prepared by a consultant or by a specialized piping contractor, to be ready when required, or can be worked out by the plant engineer from rough pencil sketches. If this plan be supplemented by a full list of all component parts, with their sources and dates of supply, so much the better.

Replacements

Records should also be kept disclosing at a glance any replacements made in pipework during each year. Whether they take the form of a card index, as in a large plant, or just a log book is immaterial, as long as information can be obtained at a glance. Any time a worn-out valve or pipe is replaced, a note should be kept for future reference.

Whenever a replacement in pipework or fittings is wanted, the order for replacement may be sent out by the buying office, but such "repeat" orders should be carefully examined by the plant engineer. For example, a certain type of valve might have caused trouble during its much-too-short lifetime, and it might be advisable for the plant engineer to specify something better and to insist on obtaining it in spite of a higher price. Instances of "grading up" are numerous. A new valve should perhaps have a stainless steel renewable seat instead of the brass seat used previously, or it should be of the streamlined seatless type to minimize pressure loss and wire drawing. In another instance it might be advisable to replace an ordinary globe valve by a V-port valve type, which is better suited to fine throttling duties.

It can hardly be over-emphasized that a regular, detailed survey of the whole piping installation should be made at least once a year, unless a major change of methods of manufacture involving the use of high pressures, temperatures and altered pipe volumes makes a special additional survey necessary in the interim. The influence of increased load on pipe strain, expansion, supports, vibration, drainage of condensate, etc. should be carefully studied.

Correction

On page 217 of the June issue, Paper Converting Machine Co. should have been credited with supplying four rewinders and four wrappers for the converting area of the Hudson Pulp & Paper Corp. mill.

Better communications

(Continued from page 403)

Third, your example should be relevant to the point you are presenting. In training this is usually automatic, but it may be necessary to change a few examples to make them apply to the problem you are discussing with the employee.

Fourth, you will find the "For example" word magic more effective if you add some variety to it. You can use these phrases to spice up your instructions—"as a case in point", "to illustrate", and "for instance".

Fifth, you will want to be alert to examples that you can use to point up your instructions. By collecting examples of both the right and the wrong way of doing something, you will make your instructions more interesting to the paper mill employees.

Yes, but

Communications between supervisors and employees can bog down when an argument develops. Everyone has opinions on different subjects, and some employees are prone to express their views in no uncertain terms. When there is a conflict of viewpoints, an argument is the natural result.

Good employee relations has a basic principle that is well known to all paper mill supervisors—*Don't argue!* Yet, there are times when it is important to change an employee's ideas and opinions to make the work move smoothly and to get things done.

The "yes, but" word magic can do this for you. When an employee

(Continued on page 448)

Pulp washing—a panel discussion

Moderator: Harry E. Weston, American Pulp & Paper Mill Superintendents Association

Panel Members: C. K. Textor, The Bauer Bros. Co.; H. K. Waters, Swenson Evaporator Co.; Ward Pitkin, Dorr-Oliver Inc. (substituting for Thomas B. Calhoun of Dorr-Oliver); Bruce Armstrong of Appleton, Wis.; C. W. Converse, Sprout, Waldron & Co. Inc., and Edwin Kemp of Bauer Bros. Co.

THE FOLLOWING is a continuation of a transcript of the discussion of pulp washing held December 4, 1956, as part of the Fifth Annual Pulp & Paper Conference at the University of Florida, Gainesville. For purposes of better continuity, the questions and answers have been regrouped, insofar as possible, under definite subject headings.

Dilution ratio

Q. (Leo Shealy, St. Joe Paper Co.) Mr. Armstrong, I would like to get a clarification of this dilution ratio. I have this: $S_v - S_1/S_v$. Is that a liquid ratio or a solid ratio?.

A. (Bruce Armstrong) "S" stands for the percentage of solids, or the relation of solids to the total liquor, in the liquor that the pulp is carrying at that particular point. "S_v" would be the percentage of solids in the vat expressed as a decimal.

Q. (Mr. Shealy) Say you were considering one stage. Would that be the liquor solids in the vat compared to the liquor solids in the sheet leaving?

A. (Mr. Armstrong) That is right.

Q. (Mr. Shealy) How do you remove the liquor from the sheet—just by pressing?

A. (Mr. Armstrong) In the laboratory you can add and measure the quantity of water and then correct for that in the analysis by standard laboratory procedure.

When you are up to about 40 per cent it is quite difficult in the average laboratory to press further and get sufficient liquor for a sample. Ordinarily, you add a measured quantity of water to the pulp and then correct for the quantity later.

Q. (Mr. Shealy) Do you think, in different circumstances, the bound liquor in the fiber will interfere with the dilution ratio?

A. (Mr. Armstrong) We never had any particular trouble with it.

Q. (Mr. Shealy) Did you dilute to a fairly low solid before you pressed it?

A. (Mr. Armstrong) We tried to get at least a 50 cc. sample to work with. More frequently, we ashed; and then used the uranyl acetate method to determine the salt cake loss. Then, we mathematically corrected it back to Na_2O for the records. We try to keep it all in consistent units of Na_2O. Then, at the end of the problem we convert that back to salt cake, which means something definite to the operator.

Q. (Mr. Shealy) What do you think of the information available on the number of showers that you have on the washer? Say you had seven showers compared with five showers. I noticed some people use seven, some use five.

A. (Mr. Armstrong) That is quite well covered in the article by Perkins, Walsh and Mappus, published in 1954. They give a formula, verified by actual tests on vacuum washers, for calculating the effect of the number of showers. It is not only the number of showers installed. Very frequently, when you go into a mill, you will see a sizeable number of showers that aren't working. The operators aren't alert enough to keep them going. If you don't put wash water into the pulp, you aren't going to wash. It is very important that a foreman check that and keep the men on their toes. I have visited a mill in Wisconsin mentioned earlier this morning. One of the reasons for their good washing results is that the mill is interested in putting out a very clean pulp. Their operators are trained to be very much on the ball. They aren't just putting in an eight-hour shift. Someone is prodding them all the time. The control chemist is getting results to the management. They know whether the men are doing their job or not. If results drop off, someone has goofed on the job.

Q. (D. F. Starr, V. D. Anderson Co.) If you are pressing and fiberizing chips directly from the digester, how does this dilution ratio fit in? What is the dilution ration in such a case as that?

A. (Mr. Armstrong) That is not a dilution ratio—it is a displacement ratio. It is the relation between the amount of wash water entering the system that gets into the final sheet. The theoretically perfect or 100 per cent dilution ratio would yield a pulp that had nothing but pure wash water in the sheet coming off the washer.

(Mr. Starr) In the paper that Mr. Converse gave, he discussed, actually, the pressing and fiberizing of chips coming directly from a digester. In this case, it is an important thing if you are able to press from 40 per cent up to 60 or 65 per cent consistency. The gain is very marked under such conditions of pressing and fiberizing.

(Mr. Armstrong) You will recall that he was referring to semichemical pulp. I believe that several times in the course of his talk he mentioned that he was referring to semichemical. Frequently, continuous digesters are used in semichemical work; and they are prone, in many cases, to have a high consistency discharge from the digester, 25 and even 30 per cent. I heard of one yesterday that was even higher than that. There is no wash water added at all. You take the chips and by a combination of squeezing out the liquor and rolling the chips so that they are worked fiber against fiber you get a very satisfactory operation. I think that perhaps Bill Converse conservatively understated it. I have seen some of the work done on that, and it is a very nice job of defibering. The power consumed in that operation not only effects the

washing of the pulp, but it gives you back some of the power you would otherwise have to spend on your refiners to get it into fiber form from chip form. If you have any more questions on it, Bill could probably answer them better than I can.

There was one other question by Bill Dedert, I think, on which I would like to comment while I still have the mike. If you recall the formula we presented yesterday—the most important variable of that formula, if you were to change the different variables in the formula over the ranges that occur in actual practice, is the dilution ratio. If we could get 100 per cent displacement we would have theoretically perfect washing, and there would be no residual in the wash pulp. So, the important thing I tried to stress—and I think it important enough to stress again—is that great attention must be paid to a lot of minute details, not one but quite a large number of them. It is quite true that, whether the pulp is at 20 per cent consistency or 40 per cent consistency, the benefit of the higher consistency can easily be lost if you don't achieve a high displacement ratio. That is the biggest factor. Suppose we assume a case in which the displacement ratio is 75 per cent. That is up near the top operating range but not at the very top at all. It is one that could be achieved in any plant with proper care and good operation. If you take (1-DR) you have 0.25 or 1/4; that means that instead of dividing by 1/4 you multiply by 4. If you had a displacement ratio of only 66-2/3, percentagewise not a big change from the 75 per cent, you would have a factor of 1/3 in the denominator, or you would multiply it by 3. A small change in the displacement ratio has a marked effect, and this formula shows it quite clearly. It explains something that appeared to be two thoughts in opposition, which is not so at all. The consistency of the pulp is very much subordinate, and the formula shows it quite clearly.

Diffuser washing, horizontal washers, washer loading

Q. (Curt Rosenblad, Rosenblad Corp.) So far as washing goes, I have spent most of my time in Sweden. I am familiar with the washing system over there. Talking about kraft pulp, all the mills are still using the diffuser washing system. The reason, I think, is that most of the mills do not run such high daily capacity as here, and also labor cost is less. They think that with the diffuser washing system they get rather good efficiency. In the last 10 years they have made improvements in the diffuser washer system, using special strainer elements, and have been able to shorten the washing time considerably or increase the capacity per diffuser. Also, they have put in central dumping valves so they don't have to use men for discharging the diffusers. This development is rather recent; and, apparently, it was too late to do anything over here in this country. The vacuum washer system is already well established here, especially considering the developments in continuous cooking and the vacuum washer being a continuous operation. We have one installation here in this country—that is Union Bag, Savannah. I would be interested to know if somebody from that company could tell me their experience comparing the present operation of the diffuser with the vacuum washing system. I believe one third of the production of that mill is still washed with the diffuser system.

A. (J. J. Owen Jr. Union Bag-Camp Paper Corp.) I would like to partially answer Mr. Rosenblad's question. We still wash over 50 per cent of our kraft pulp in diffusers at Savannah. The diffusers in which we installed the Markilla-Brax strainers and Sandberg valves, after some operating difficulties as always occur, are performing satisfactorily. We got the increased production on them, almost as much as we expected; and it was the most economical way we could get that production at that particular time. If we have to put in more washing equipment, I think it will probably be washers because of space and many other things. However, that will have to be considered at the time that it comes up.

Q. (Harry E. Weston) Mr. Shelow, what is the experience you have had in washing cotton linters as compared to some of the wood pulps we have been talking about?

A. (W. S. Shelow, Buckeye Cellulose Corp.) We are using horizontal washers in Memphis on part of our pulp. We are interested in a somewhat different aspect of washing. We are not so much interested in recovering the liquors; in fact, we let those go. We are interested, however, in removing as much of the dissolved solids as possible and do remove them down to a considerably lower level than you do in kraft washing. Our experience in the matter of diffusion, along with Mr. Armstrong's curve here, is that diffusion plays a very important part in our washing. We are interested in the lower levels of washing. Actually, Mr. Armstrong's curve showed that diffusion took place in 4 min. I believe that was practically the top of the curve. We find that the curve for our pulp continues over approximately a 30-min. period. So, we in our work might seriously consider the use of diffusers.

Q. (Mr. Armstrong) I think it might be of interest to know what range you do get down into. Do you have an average figure on it?

A. (Mr. Shelow) I cannot state it in the terms of Baumé, because our liquors are not that concentrated. I can state this. Leaving our washers, we would come down to a total solids content in the range of 2-8 lbs. per air dry ton.

Q. (G. W. Hough, Waldorf Paper Products Co.) I haven't heard anyone mention the horizontal washer. It seems that Dorr-Oliver is coming up with a horizontal washer. How about it, Mr. Pitkin?

A. (Ward Pitkin, Dorr-Oliver Inc.) We have been building horizontal washers for a number of years. We first used them in various process industries other than the pulp and paper industry. Then we began to use them on special fiber products, particularly cotton linters. The main reason for using them there was the character of the fiber. It is not as easy to pick up a sheet on a drum with this cotton linter fiber as it is with a wood fiber. It is easier to put the sheet on in the horizontal plane. One of the factors to be considered with the horizontal washer is the fact that it is not as easy to build them with large areas as it is a drum washer. We are building drum washers of up to 720 sq. ft. now. You rarely see brown stock washing systems going in with less than 400 sq. ft. per unit. A 15-ft. diameter horizontal has 165 sq. ft. of area; and a 19-ft. horizontal around 270 sq. ft. So, the horizontal area really stops before your drum area begins, relatively speaking. In other words, the small drum filters are even larger than the large horizontals. Our use of them, so far, has been mostly on special

(Continued on page 448)

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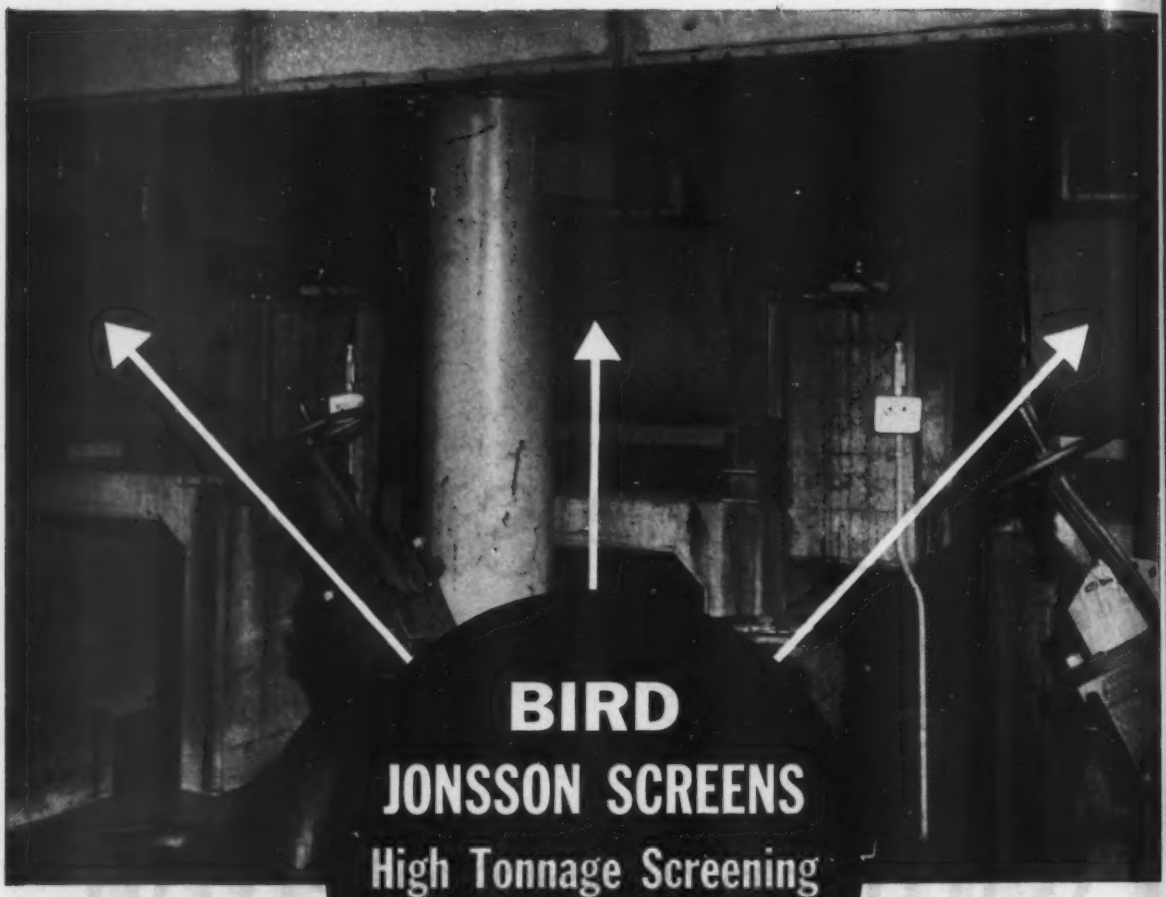

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CURRENT COMMENTS

Newsprint: supply over demand . . . profit position . . . and Asian shortage

by WARREN B. BULLOCK

A radical change in the statistical relationship between newspaper usage of newsprint and the producing capacity of the newsprint mills is rapidly developing. Despite the newspaper industry's waving of the crying towel, with requests for United States government help in adding to newsprint-producing capacity, the present situation is not merely a balance between consumption and production but an actual surplus of producing capacity.

The Department of Commerce, through H. B. McCoy, head of the department's Business and Defense Services Administration, has reported to a committee of the House of Representatives that during the next three years United States capacity increases are expected to more than meet the growth in domestic demand, with the result that newspaper imports may decline. His forecast is for a demand of 8,250,000 tons in 1965, as compared with 6,750,000 tons in 1956. For 1957, 1958 and 1959 he forecasted a growing margin of supply over demand.

Announcement by Great Lakes Paper Co. Ltd. of Fort William, Ont., that it has begun operation of a new machine that will increase producing capacity more than 300 tons per day means in round figures 90,000 tons annually. This increase more than brings United States and Canadian producing capacity to the estimated requirements of the publishers. Even previous to this addition to operating capacity it had been computed that 1957 production of North American newsprint would exceed the normal demands of the publishers. This forecast has been confirmed by the fact that several Canadian mills are now back to a normal production week of five days, thereby saving the additional cost of Saturday and Sunday operations.

More U. S. newsprint

Statistics have shown that United States production capacity has increased at a higher proportion in the last year or so than has been the case in Canada, even though the Canadians have increased capacity by machine speed-ups and modernization. Plans of Allied-Albany Paper Corp. to convert tissue machines at the old Albany plant to the production of newsprint show that the trend toward increased newsprint production in this country is not over. A side comment may be pertinent: The situation as to magazine and book papers is not so favorable to the publishers in these fields as is the case with newsprint.

It was not long ago that the officials of the American Newspaper Publishers Association were appealing to Congress to assist in developing additional newsprint producing capacity, even to the extent that a subsidy to newspapers was suggested. New York newspapers, as well as others, have been increasing their subscription rates; but whether such increases will curtail newspaper buying by the public remains to be seen. Newsprint prices have risen, but not in proportion to higher prices for other grades such as fine and book papers.

Profit (?) in newsprint

A significant discussion of the profit position of the newsprint industry developed in hearings recently held at Washington before a subcommittee of the House of Representatives Committee on Interstate and Foreign Commerce. Cranston Williams in his testimony on behalf of the publishers questioned the accuracy of statements by Robert M. Fowler, head of the Canadian newsprint manufacturers, who had said that in view of present conditions it would be impossible to construct a new paper mill and net a better return than 4.2 per cent at going prices for the product. Williams thought this figure was far too low. Chairman Oren Harris of the sub-committee, however, countered Williams' statement with the comment that a friend had considered building a newsprint mill, but that after exhaustive investigation had found it would be impossible to anticipate better than a 4 per cent return. This return, Harris said, was far too low to justify the risks attendant on investment in a new enterprise.

Current stock market quotations indicate that paper mill stocks as a rule are not far above a 3- to 4-per cent dividend basis and this on mills built before the present wage-price spiral pyramided construction costs.

Indefinite shutdown

The depressed condition of the textile industry is having a significan repercussion on the pulp industry. Rayonier has announced plans to close its Shelton, Wash. cellulose plant on August 9 for an indefinite period. The ascribed cause for this decision is the drop in demand for the grade of cellulose used by manufacturers of cellophane. The company hopes to find a new field for its product in order to justify reopening its capacity of 110,000 tons a year.

While the paper situation is important to the United States with its high annual per capita consumption, a paper shortage is disturbing Asia. A United Nations conference of the 20-nation Asia-Pacific Forestry Commission pointed out that average consumption of paper and pulp in Asia is only 9 lb. per capita as compared with from 88 to 308 pounds per capita in the more literate nations of Europe and the Americas. A lack of paper, according to the report made to the United Nations Food and Agricultural Organization, is handicapping the campaign for increased literacy among the teeming millions of the Far East. Ambitious plans for development of home paper- and pulp-producing

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Current Comments . . .

industries were reported by Australia, Burma and India. A conference in 1959 is already being planned for further promotion of forestry programs for the Asiatic nations.

Financial Reports

July saw prices on Wall Street rising to a record for the year. Paper mill securities were affected favorably to a limited extent only.

Net Incomes

American Box Board Co.—Net income for the quarter ended February 28, $382,332; for the same quarter in 1956, $514,680.

Unibn Bag-Camp Paper Corp.—Net income for the first quarter of 1957 was $4,752,273, as compared with the combined income in the first quarter of 1956 (before the merger) of $5,511,000.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	July 10, 1957	June 10, 1957
Celotex	30¾	34½
Same Pref.	17¾	18
Certain-Teed	9¼	9⅛
Champion P & F	37½	37
Same Pref.	90	90½
Chesapeake Corp.	26	26
Container Corp.	19⅝	18
Same Pref.	*87-90	*89-91
Crown Zellerbach	57⅞	51⅞
Same Pref.	*88-91	92½
Eastern Corp.	26¾	27½
Federal Paper Board	33¾	36
Same Pref.	*187⅛-19¼	*19½-19¾
Fibre Paperboard	38	28⅛
Same Pref.	*105¼-106	*103-105
Great Northern	77	72
Hammermill	34¼	32¼
International	108½	103½
Same Pref.	*86¾-90	*85¾-91
Kimberly-Clark	48½	48¼
McAndrews & Forbes	28	29¾
Marathon	30	30⅜
Masonite	34	32½
Mead Corp.	39	37
Same Pref.	89	91
Minnesota & Ontario	31	31⅜
Oxford Paper	37¾	40¾
Same Pref.	*90½-91½	*92-93
Rayonier Inc.	26⅛	26
Riegel	28¼	28¾
Scott Paper	61½	60¾
Same $3.40 Pref.	*82-95	84½
Same $4 Pref	*93-95	—
Sealright	27⅜	27½
St. Regis	34	33¾
Same Pref.	88	*91-94
Sutherland Paper	35¼	32½
Union Bag-Camp	35¼	32½
United B & C	26½	22½
United Wall Paper	8½	9
Same Pref.	*16-17½	*17-19
U. S. Gypsum	63⅜	61⅜
Same Pref.	*153-158	*157-158
West Va. P. & P.	44¾	44¼
Same Pref.	100	*103-104

New York Stock Exchange — Bonds

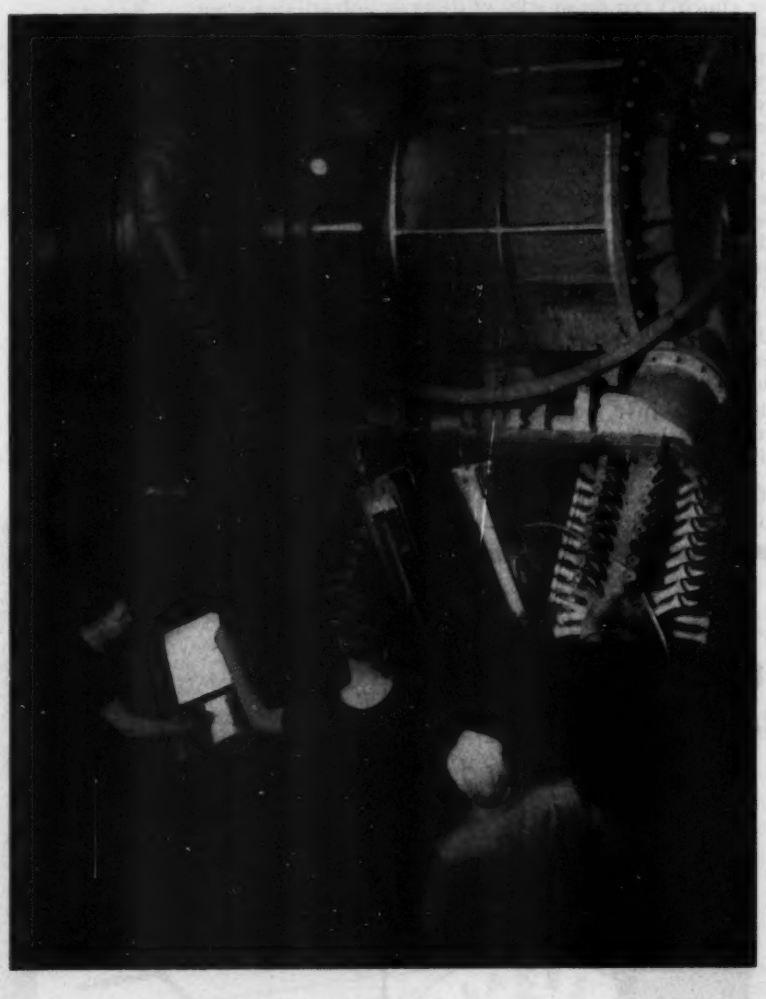
A.P.W. Products 5%	81	81
Champion P & F Co. 3¾%	—	—
Champion P & F Co. 3%	—	—
Mead Corp. 3%	—	—
Scott Paper 3%	96	96⅞

American Stock Exchange — Stocks

Allied Paper	13½	15⅛
American Writing	22	—
Brown Co.	18¼	16⅜
Puget Sound	15	15¾

*Closing Bid and Asked Prices.

Rated performance of every Nash Vacuum Pump is assured by this precise laboratory test



Rated capacities of Nash Vacuum Pumps are not theoretical. Every Nash Pump is tested individually. Air capacity is determined by delivery thru accurately machined and calibrated orifices. Related vacuum is measured by precise mercury column, and horse power is recorded electro-dynamically. Records of these tests are retained by us, and certified copies are available to Nash Pump owners.

That is one of the reasons why Nash Vacuum Pumps are installed in over a thousand leading Paper Mills. An engineer from Nash will be glad to survey your mill, and make recommendations, entirely without obligation to you.

NASH ENGINEERING COMPANY

440 WILSON ROAD, SO. NORWALK, CONN.

SMOOTH HANDLING ALL THE WA

...ON CRAWLERS
...ON RUBBER

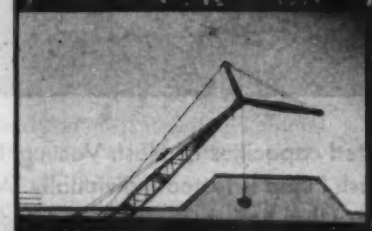
When you are piling to a wall of pulp like this a jumpy boom caused by the jerking and grabbing of ordinary swing clutches can mean a lot of delay in unloading a train or feeding a belt.

You have never been on a smooth working crane until you've been on a Northwest. The Northwest "Feather-Touch" Clutch Control brings power operation to the main drum clutches and at the same time preserves the *feel of the load* for the operator. Northwest Swing Clutches are Uniform Pressure Swing Clutches that give even pressure over the entire area of the clutch. This means smooth swing and perfect control of the machine and load. Smoother boom handling is augmented by the wide selection of Northwest boom hoist equipment—the standard Worm Boom Hoist, the Northwest High-Speed Boom Hoist (independent of all other operations with power controlled lowering). The third drum that permits 3 load lines with either of the above boom hoists. Here you can get just the right equipment for handling any combination of problems.

These are just a few of the things that make the Northwest a better crane. A Northwest Man will be glad to give you the rest of the story.

NORTHWEST ENGINEERING COMPANY
1516-2 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

35 TON TRUCK CRANE



25 TON TRUCK CRANE

NORTHWEST

The Crane That Goes Anywhere

10 to 50 TONS

WESTERN UNION

W. P. MARSHALL, PRESIDENT

FX-1201

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=Int'l Letter Telegram
VLT=Int'l Victory Ltr.

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...s is a full-rate ...ram or Cable... unless its de... ...d character is in... ...ed by a suitable ...ol above or pre... ...ng the address.

...ling time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

NA008 59 NL=CNT FORT WILLIAM ONT JUN 14=

FRANK T PETERSON, BLACK CLAWSON CO=

:250 PARK AVE NYK=

WE ARE PLEASED TO ANNOUNCE NEWSPRINT SHEET SUCESSFULLY CARRIED THROUGH TO WINDERS TODAY ON NUMBER THREE MACHINE. START UP WAS ON SCHEDULE AND THIRTEEN MONTHS FROM COMMENCEMENT OF CONSTRUCTION. NUMBER THREE MACHINE INCREASES OUR INSTALLED NEWSPRINT CAPACITY BY FIFTY SEVEN PER CENT CONSTRUCTION OF NUMBER FOUR MACHINE IS ALSO PROCEEDING ON SCHEDULE=

THE GREAT LAKES PAPER CO LTD=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS ...

GREAT LAKES PAPER CANADA

Installation photo on reverse side

Black-Clawson Hydroflyte Newsprint Machine—272" Permanent Cantilever Fourdrinier now in operation.

Latest refinements of vacuum pick-up for high speed sheet transfer to the presses.

New Machine Increases Newsprint Capacity 57% at Great Lakes Paper Company Ltd.

The 2500 fpm Newsprint Machine supplied to the Great Lakes Paper Company by Black-Clawson (Canada) Ltd. represents the most modern conception of newsprint machine design and engineering principles.

Designed, engineered, manufactured and erected by Black-Clawson's Paper Machine Division, Watertown, N. Y., and Black-Clawson (Canada), Montreal facilities, this is Great Lakes' No. 3 Machine.

THE BLACK-CLAWSON COMPANY
PAPER MACHINE DIVISION, WATERTOWN, N. Y.

Executive Offices	230 PARK AVE., NEW YORK, N. Y.
Pulp Mill Equipment	PANDIA DIVISION, Hamilton, Ohio
Stock Preparation Equipment	SHARTLE DIVISION, Middletown, Ohio
Converting Machinery	DILTS DIVISION, Fulton, N. Y.
Canadian Sales and Manufacture	BLACK-CLAWSON (CANADA) LTD., Montreal, P.Q., Canada
British-European Sales and Manufacture	BLACK-CLAWSON INTERNATIONAL LTD., London, England
District Sales Offices	Atlanta, Ga. • Downingtown, Pa. • Appleton, Wisc. • Portland, Ore.

NEWS of the INDUSTRY

ABOVE—New 750- by 80-ft. building that houses the new paper machine at the Biron Div. of Consolidated Water Power & Paper.

LEFT—High-speed Beloit machine for the production of enamel paper at the Biron Div. Climaxing a $15,000,000 expansion program, the new unit will produce a 15-ft. sheet at speeds in excess of 2000 fpm.

Start-Up Climaxes $15,000,000 Program at Consolidated WP&P

PRODUCTION OF ENAMEL paper at speeds of more than 2000 fpm is now possible at the Biron Div. of Consolidated Water Power & Paper Co. in Wisconsin Rapids, Wis. The firm has announced completion of a $15,000,000 expansion centered around the installation of a Beloit Iron Works machine.

The unit is now operating at 1400 fpm producing a sheet 184 in. in width. According to Stanton W. Mead, president of Consolidated, it was erected to meet the increasing demand for enamel printing papers used by publishers and commercial printers.

The Beloit machine increases the mill's production by 60,000 annual tons and is the company's 10th unit devoted exclusively to enamels.

Suction Pickup Featured

Incorporated in the new No. 5 is a suction pickup device to permit the high-speed operation. Other machine features include a pressure headbox, Consolidated coater, continuous broke system, enclosed hood and a new-type winder handling 88-in. diam. reels. A strain gauge scale permits the semi-automatic weighing of rolls while in transfer from machine to supercalenders.

To accommodate the new production unit and expanded auxiliary facilities, more than 230,000 sq. ft. were added to the Biron Div. plant.

Included was a 10-story boiler and steam turbine plant that boosts the firm's generating capacity by more than 15,000 kw per hour. Heart of the addition is a 1450-lb. boiler that is reported to be one of the highest-pressure units in the paper industry.

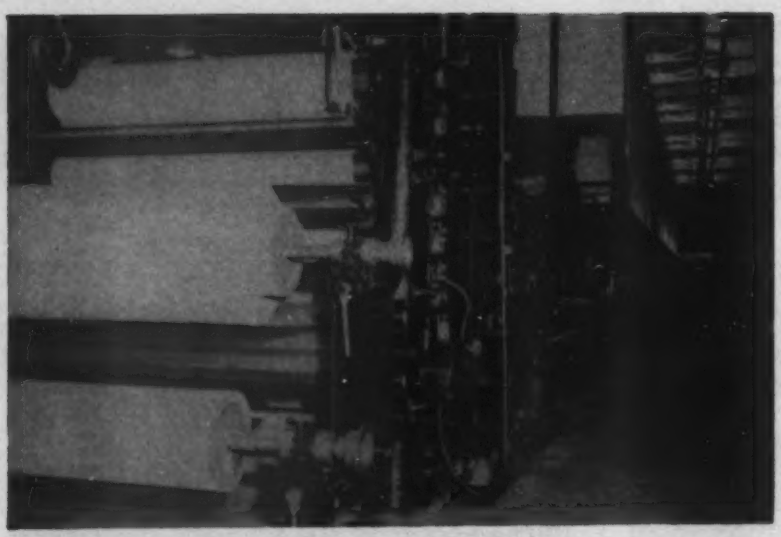
Hot Pond and Slashers

A 9- by 120-ft. hot pond was built to handle 100-in. spruce and poplar for groundwood. The pond is 12 ft. deep. Included is a jack ladder to the woodroom equipped with hydraulic slasher saws. The only addition to the two-drum woodroom was a blade-type hydraulically-operated wood splitter for large-diameter logs.

An automatic system of chain and belt conveyors has been installed to move poplar pulpwood from the woodroom to the mechanical pulp

Major Suppliers for Consolidated Water Power & Paper Project

Paper machine	Beloit Iron Works	Coal-handling equipment	Chain Belt Co.
Consistency regulators	DeZurik Corp.	Turbine generator	General Electric Co.
Screens	Bird Machine Co.	Boiler feed pump	Ingersoll-Rand Co.
Vacuum pumps	Nash Engineering Co.	Water treatment system	Infilco Inc.
Hood and ventilating system	J. O. Ross Engineering Corp.	Slasher saws	D. J. Murray Mfg. Co.
Liebeck disintegrators	E. D. Jones & Sons Co.	Splitter	Carthage Machine Co.
Supercalenders	Appleton Machine Co.	Grinders	Appleton Machine Co.
Rewinders	Cameron Machine Co.	Conveyors and drives (groundwood)	Link-Belt Co.
Drives and MG sets	General Electric Co.	Screen	Allis-Chalmers Mfg. Co.
Stock meters	Trimbey Machine Co.	Double-disc refiner and cleaners	Bauer Bros. Co.
Pumps (stock proportioning)	Goulds Pumps Inc.	Decker and thickener	Improved Machinery Inc.
Instruments (stock proportioning)	Taylor Instruments Cos.	Accelator	Infilco Inc.
Clay and starch unloading system	Dracco Corp.	Chemical feeding pump	Wallace & Tiernan Inc.
Storage silos (clay and starch)	Sprout, Waldron & Co. Inc.	Filter beds (under drainage)	Infilco Inc.
Boiler	Babcock & Wilcox Co.	Outlet pumps	Ingersoll-Rand Co.



FIRST REEL of paper comes off New York & Pennsylvania's new Beloit machine.

New Fourdrinier in Operation at NY & Penn

A 108-in. Beloit Iron Works fourdrinier machine has gone into production at the Lock Haven, Pa. mill of New York & Pennsylvania Co. Top daily capacity of the new unit is 50 tons. Equipped with a tub press, it is scheduled principally for the production of offset and other surface-sized paper grades.

The tub press equipment is tied into new size preparation facilities, along with tub presses on three other machines. The new system is capable of simultaneously supplying all four machines with any quantity of size that might be required. The system is heavily automated and contains four 4300-gal. rubber-lined storage tanks.

department via a new wet storage tank. Semichemical and sulfite requirements are produced by the Wisconsin Rapids Div. and slushed to the Biron Div. by way of an existing underground pipeline.

Groundwood Capacity Doubled

Groundwood capacity has been increased from 100 to 200 daily tons at the Biron plant by the addition of three new continuous ring-type grinders and the conversion of two existing grinders from 33-in. to 50-in. wood. Expanded bleaching facilities, which include a new continuous medium consistency (18 per cent) bleaching tower, are housed in a new 11,000-sq. ft. addition to the bleach plant.

The industry's first bulk starch-handling system—which is expected to reflect a substantial cost savings over the conventional packaged starch—has been incorporated to serve the entire plant. The system combines the pneumatic and mechanical conveying of starch and clay from railroad cars to five bulk storage silos and to the coating preparation department.

Automatic Stock Metering

An automatic stock metering and proportioning system blends and meters up to five pulps. It serves the new No. 5 machine as well as three existing enamel paper units.

Two new supercalenders finish paper from No. 5. They are loaded on the machine floor and operated from the ground floor to facilitate handling.

To meet water requirements for the expanded production, both raw water and filter plant capacity was increased from 6,000,000 to 12,000,000 gal. per day. Included were new raw water filters, accelerator and two filter beds.

A continuous coating makedown system has been incorporated in the coating preparation department to serve No. 5 unit and three other machines.

$5,000,000 Expansion at Thilmany Nears Completion

Operation of a new paper machine as part of a $5,000,000 expansion program was expected to get underway at Thilmany Pulp & Paper Co. early in July. The project enables the Kaukauna, Wis. firm to meet the growing demand for machine-glazed and protective papers.

The 165-in. permanent cantilever fourdrinier machine incorporates one of the largest Yankee dryers to be operated in North America. Measuring 15 ft. in diam. with a 168-in. face, it was constructed in England by Bentley & Jackson Ltd. and shipped through the Great Lakes to Milwaukee, from where it was scheduled to go to Kaukauna by truck.

The paper machine itself was constructed in Watertown, N. Y., by the Black-Clawson Co. and has a daily production capacity of up to 65 tons operating at speeds of up to 1200 fpm. It is equipped with a pressure headbox and a 36-in. cantilever suction couch. A single suction dual press will comprise the press section.

The double-deck dryer section has 60-in. pre-dryers, a 6-ft. lead-on dryer, the Yankee and 60-in. after-dryers, followed by an open-side calender, an Autoflyte reel and a winder.

Oregon Sets Sights on Full Waste Utilization

Oregon has launched a program to convert its wood waste into payrolls, jobs and industrial opportunities.

Specifically, the state with more acres of commercial forest land than any other is setting the wheels in motion to bring about greater utilization of its wood residue by undertaking extensive research and development studies.

In its extensive survey of this potential raw material supply, the Oregon Development Commission retained Sandwell & Co., Vancouver, B. C. consulting engineers. And the Sandwell Report, blueprinting a plan and following through with specific courses of action, "already has begun to bear fruit". This according to Joseph W. Smith, ODC chairman.

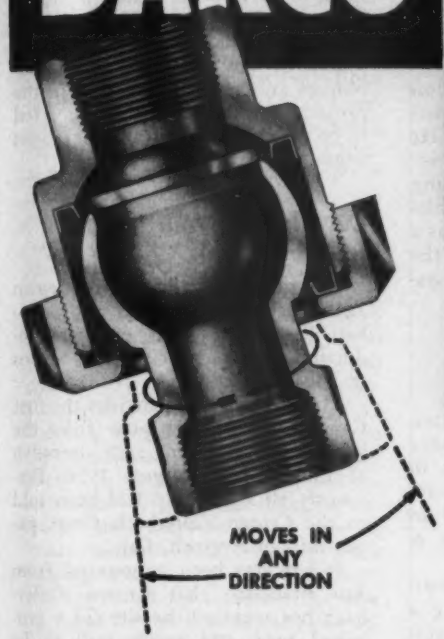
Estimates and Statistics

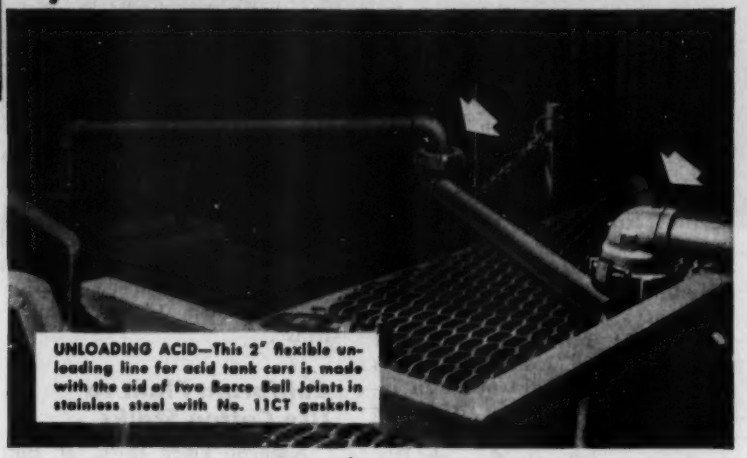
Sandwell engineers estimated that the potential raw material supply is about 900,000 bone dry tons per year of wood chips, corresponding to 450,000 air dry tons of chemical fiber for papermaking.

The firm then found three areas in the state that are particularly suitable for the establishment of wood composition board industries and picked nine other sites that have basic factors conducive to the establishment of pulp and paper mills.

In cooperation with the ODC, trade organizations and other groups in these specific areas then began studies to show the extent of raw

BARCO *Flexible* BALL JOINTS





UNLOADING ACID—This 2" flexible unloading line for acid tank cars is made with the aid of two Barco Ball Joints in stainless steel with No. 11CT gaskets.

... for handling

ACIDS • CAUSTIC SOLUTIONS BLEACH CHEMICALS

in Pulp and Paper Mills

Leading manufacturers of all kinds of chemicals used in pulp and paper mills recommend use of BARCO BALL JOINTS wherever you must provide for *flexibility* or *movement in piping.* Here's why:

Barco's *standard* malleable iron ball and casing offer good resistance to chemical action and corrosion. Where additional protection is desired, these parts can be supplied in stainless steel or virtually any alloy specified.

Barco's new No. 11CT gaskets are impervious to chemical action and maintain a tight seal without interfering with the easy turning action of the joint. No lubrication is required.

One Barco Ball Joint will do the work of two or more swivel joints because it *"moves in any direction."*

Barco Ball Joints can help you in many ways. Use them in your mill! Barco also makes revolving joints (for continuous higher speed rotation), swivel joints, and swing joints for other kinds of pipe movement. For complete information, write BARCO MANUFACTURING CO., 526-J Hough St., Barrington, Illinois

1. **NO METAL-TO-METAL CONTACT BETWEEN MOVING PARTS.**
   An important Barco advantage where corrosive chemicals are present, either externally or internally.
2. **CHEMICALLY INERT GASKETS.**
   Barco offers a choice of seven types of gaskets including No. 11CT for corrosive service. No lubrication required.
3. **STAINLESS STEEL.**
   Also regularly furnished in Malleable Iron, Steel, Bronze, and Aluminum. Other special alloy joints to order.
4. **MAXIMUM FLEXIBILITY.**
   Up to 40° side flexibility with 360° rotating movement.
5. **PRESSURE SAFE! FIRE-PROOF!**
   Unequalled for SAFETY where flexible connections are required.
6. **MANY STYLES AVAILABLE.**
   Angle or straight; threaded or flanged connections. For pressures to 7,500 psi; temperatures to 1000° F. 15 different sizes. ¼" to 12".

DIGESTER—4" Flanged Barco Malleable Iron Ball Joints with No. 11 gaskets give excellent service in connecting piping to slow revolving spherical digesters.

materials supplies immediately available to a mill site, likely mill sites in each area and statistics to aid in the determination of the most economic size and type of mill adapted to the region.

The information will be compiled in report form and made available to prospective wood residue-using industries.

If the raw materials potential is fully utilized, Smith noted, it would represent a 60-per cent increase in the present utilization factor of wood residue. Translated into jobs and payrolls, it could mean an increase of approximately 3100 jobs and $15,000,000 in payrolls.

Forest Industries Must Use Wastes: Thiesmeyer

The increasing costs of material and labor make it mandatory that the forest industries develop the maximum use of every kind of waste. This according to Dr. Lincoln R. Thiesmeyer, president of the Pulp & Paper Research Institute of Canada, as he addressed the 11th annual meeting of the Forest Products Research Society in Buffalo, N. Y.

Efficient operation, he said, demands complete utilization of the solid, liquid and gaseous wastes that constitute about 30 per cent of the industry's raw materials.

Dr. Thiesmeyer urged conversion from piecemeal to continuous operations as a step toward economy. He suggested that pulp producers investigate the possibility of sending chipped wood via pipelines or cableways from the forest to the mill as a substitute for what he called "the present batch transportation systems".

California Plant to Use Cotton Stalks

Kerncot Fiber Corp. at Buttonwillow, Cal., will attempt to make cotton king once more. At least in southern California, where the recently organized firm has leased an unused plant from Pacific Gas & Electric Co.

Kerncot Fiber will spend an estimated $3,500,000 in establishing a paper plant designed to utilize cotton fibers in the manufacture of paper products. Operations on an experimental basis are expected to get underway this fall, with full production scheduled to begin in 1958.

An estimated $25,000 has been spent to date on the plant operation. Between 6000 and 7000 acres of cotton land have been leased as a source of raw material. Eight employees are currently engaged in the project, but the payroll is expected to be 200 when full-scale operations begin.

CZ Elk Falls Mill In Production

The new Elk Falls mill of Crown Zellerbach Canada Ltd. at Campbell River, B.C., has entered production. Daily capacity is 175 tons of bleached kraft.

The bleach plant provides the first Canadian outlet for pulp from the kraft mill that went into operation at Elk Falls in August 1956. Previously all kraft pulp had been sold to the Crown Zellerbach Corp. paper mill in Antioch, Cal.

It has also been announced from San Francisco that Crown Zellerbach has acquired the site for a proposed pulp and paper mill to be built near De Ridder, La. The firm exercised options taken out early in 1956.

The report was issued in De Ridder by Vertrees Young, CZ vice president in charge of mill and timber operations for the Gaylord Container Div.

The company simultaneously exercised options on 27,000 additional acres adjacent to De Ridder in southwestern Louisiana. A portion of this property would serve as a lagoon to impound mill effluent. Much of the remainder would be used as the nucleus of a reforestation program.

Knowlton Project Nears Completion at Watertown

Knowlton Bros., Watertown, N. Y. manufacturer of specialized papers for industry, announces that a $1,000,000 expansion and modernization program undertaken in 1952 is scheduled for completion by the end of the year. Goals in the project were improvements in quality control techniques, expansion of over-all plant capacity and product diversification.

The two major features of the program have been the installation of a pilot fourdrinier for small-volume experimental and test runs and the addition, now underway, of a

Tidland
PNEUMATIC SHAFTS
custom-engineered, collapsible, for winding, rewinding or unwinding rolls of any material. Proved savings for producers, printers and converters of papers, films, foils, rubber and fabrics.

▲ LEAF TYPE SHAFTS FOR WINDING
▲ LUG TYPE SHAFTS FOR UNWINDING
▲ SPECIAL SHAFTS FOR ANY SERVICE

SAVE SET-UP TIME. "Lug" type shaft for unwind eliminates chucks, and when used for rewind operation does away with spacer cores or collars; calibrated for quick, easy alignment of web. "Leaf" type for rewind with or without cores.

UNIFORM NON-SLIP GRIP. Four-way air expansion for positive non-slip gripping; centers shaft in core; eliminates core damage.

RELEASES INSTANTLY. A quick-release valve deflates air tube instantly. Collapsed Tidland Shaft slips out easily. No hammers, wedges or wrenches needed.

Get your Tidland Shafts from
CAMERON
the world's leading producer of slitting and winding equipment.

CAMERON MACHINE COMPANY
61 POPLAR STREET, BROOKLYN 1, N. Y.
Canada: Cameron Machine Company of Canada, Limited, Royal Bank Bldg., Toronto 1, Ont.
France: Batignolles-Chatillon, 5 Rue De Monttessuy, Paris (7e) France

development and research laboratory.

Other aspects of the expansion and modernization included (1) conversion of wooden tile-lined beaters and stock lines to all-stainless steel construction with increased capacity; (2) the addition of a metal-working and fabrication shop for plant equipment maintenance; (3) the purchase of an E. D. Jones & Sons Co. Hi-Lo pulper; (4) the installation of electronic beta gauges for precision control of paper uniformity; (5) the installation of a special microscopic device for accurate measurements of in-process roll width; (6) the addition of radioactivity-detection equipment for checking the process water used in the manufacture of photographic papers; (7) the development and installation of pneumatically-controlled stuff gates on fourdriniers to insure uniform consistency in stock feeding, and the use of weight control apparatus for metering the flow of water to the beaters; (8) the installation of roll brushers and vacuum cleaners on rewinders, and (9) materials handling and storage improvements.

FTC Orders International to Sell Longview Stock

The Federal Trade Commission has ordered International Paper Co. to sell its recently acquired stock in Longview Fibre Co. of Longview, Wash.

The big papermaker, however, will retain most of its interest in Long-Bell Lumber Corp. and in Long-Bell Lumber Co. (International acquired its interest in Longview Fibre through its Long-Bell holdings.)

Thus, International keeps its 450,000-plus acres of timber assets acquired in the acquisition of Long-Bell last November.

IPCo also promised not to acquire any interest in its competitors for the next 10 years and in addition pledged for a 10-year period to sell at least 40 per cent of the output of a proposed West Coast mill to independent purchasers in 11 western states.

The proposed Oregon plant will utilize timber resources, formerly controlled by Long-Bell.

John H. Hinman, chairman of International Paper, issued the following statement after the FTC order was announced:

"We are satisfied with and will certainly abide by the FTC's consent

ANHEUSER-BUSCH, INC.

Sign of highest quality for the PAPER INDUSTRY

GUMS
For tub sizing, coating and calendering.

STARCHES
Standard and special for beaters, tub sizing, coating and corrugating.

DEXTRINES
For coating, laminating and paper converting.

GELATINIZED STARCH
For beaters.

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COLUMBUS, GA.
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POIRIER
Counterflow

CONSISTENCY AND BASIS WEIGHT REGULATOR

Poirier's Counterflow Regulator is guaranteed to prevent basis weight variation regardless of incoming consistency.

To you, this means more uniform finished paper, quicker, easier and more economical.

HERE'S WHY: —

- Basis Weight controlled to within 2% (+—); consistency 1/10 of 1%.
- Volume regulated even when stock is too light to be controlled by consistency.
- No moving parts.
- Outgoing consistency may be controlled to as low as .5%.
- Operates on all tonnages and grades.
- May be applied from knotters to paper machine.
- Position available for attachment of part of Poirier Machine Variation Control.

Let our engineers study your operation and furnish you with complete details on how a Poirier Counterflow Regulator will help you as it has others. No cost — no obligation.

Write for full information.

POIRIER CONTROL COMPANY
Waterville 9, Maine

Specialists in
Stock Control Equipment

272-INCH newsprint machine that has gone into production at the Fort William, Ont. mill of Great Lakes Paper Co. Ltd. Daily production of the 32-lb. sheet is 300 tons.

New Great Lakes Machine Increases Output by 57%

Great Lakes Paper Co. Ltd. has reported the start-up of its new No. 3 newsprint machine at Fort William, Ont. The unit increases the company's installed capacity by 57 per cent.

The 272-in. machine—a product of the Paper Machine Div. of the Black-Clawson Co. working in co-operation with Black-Clawson (Canada) Ltd.—went into operation on schedule in the record time of 13 months after construction was started.

Designed to operate at 2500 fpm and to produce more than 300 daily tons of standard 32-lb. newsprint, the unit features a Hydroflyte permanent cantilever fourdrinier with an integrally-mounted suction couch and a high-speed pressure headbox.

Transfer of the sheet is made by a vacuum pick-up to the suction presses. A double-deck dryer section, an openside calender, an Autoflyte high-speed reel and a Black-Clawson slitter-rewinder comprise the balance of the machine.

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order against International Paper Co. in connection with its merger with the former Long-Bell Lumber Companies. . . . Perhaps I should add that nothing has occurred to change our own or our counsel's conviction that the merger involved no violation of the anti-trust laws."

(By signing a consent order, International of course did not admit guilt.)

Indefinite Shutdown Set for Rayonier Mill

The Shelton Div. mill of Rayonier Inc. was to discontinue operations for an indefinite period on August 9. The chemical cellulose plant at Shelton, Wash., is the oldest mill in the Rayonier group.

The action was taken "because of a decline in the demand for the types of chemical cellulose produced" at the plant. It will remain down until pulp demand sufficiently strengthens to warrant reactivation.

The shutdown was to necessitate laying off approximately 385 employees. They were notified that the mill was to continue to operate another 30 days even though there were no firm orders for the production.

Employees' rights in the pension plan are being protected. Additionally, an extension of group life insurance coverage was offered, with the major cost borne by Rayonier.

During the idle period, Rayonier will continue to work on projects to qualify the Shelton mill for a permanent permit from the state pollution control commission.

Despite the drastic change and readjustments in chemical cellulose

markets throughout the world, Rayonier firmly believes that the long-term demand for chemical cellulose will grow. Because of this, the Shelton mill has been "moth-balled". It will be kept in such condition so that it can be started up on relatively short notice.

K-C Completes Major Expansion Program

Kimberly-Clark Corp. at Kimberly, Wis., has completed a major expansion project with the start-up of a new double coated printing paper machine. The high-speed multimillion dollar unit climaxes more than a year of construction and a revamping of a major portion of the five-machine mill.

The paper machine is designed to produce a 14-ft. sheet at speeds of up to 2000 fpm. The daily capacity is 190 tons, increasing by 40 per cent the mill's over-all capacity.

The project included the addition of two new repulpers and an elaborate conveying system that automatically blends any combination of five pulp types; the construction of 175- and 136-in. supercalenders; a new bleachery building and coating plant; an addition to the water treatment plant, and a changeover of electrical power to 60 cycles.

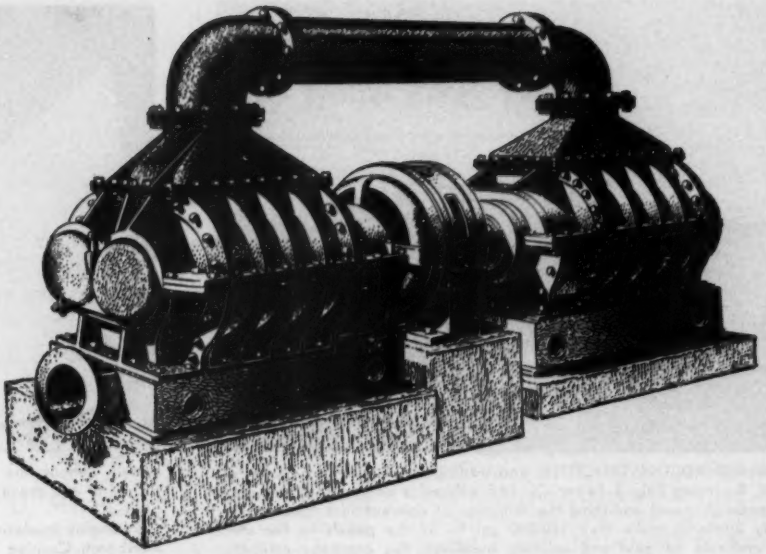
New Firm to Make Artificial Fibers

Resinova Inc. is a recently established firm that will manufacture artificial and synthetic fibers in the United States. Announcement of the project was made by Dr. Paolo Marinotti of Snia Viscosa in Milan, Italy.

Resinova, in association with the Ozalid Div. of General Aniline & Film Corp. and Schwarzenbach Huber Co., is also preparing to produce the new high-strength paper-fabric, Papertex.

Developed by Snia Viscosa and introduced in the United States in April, Papertex is a light nylon fabric coated with chemically-bonded acrylic resins. It has been reported that the product is tear-proof, non-combustible and impervious to insect or water damage. Dimensional stability, it is said, allows Papertex to be folded up to 70,000 times without cracking.

Resinova plans the production of



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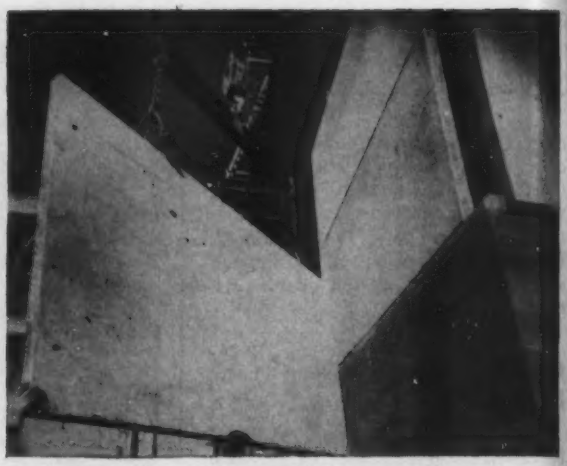


WHEN RECONSTRUCTING and adding to its plant at Lancaster, N. B., Irving Pulp & Paper Co. Ltd. utilized a concrete-cellular glass sandwich panel one-third the thickness of conventional construction. By applying more than 180,000 sq. ft. of the panels to the steel framework of new and existing buildings, the company estimates that the construction time was half of normal (savings were on the basis of the 18-in. conventional wall).

According to Hans W. Kohn, chief engineer and assistant manager, Irving Pulp & Paper is an "expanding firm, and by utilizing these panels, when we need to move a piece of machinery we merely unhook the sandwich panel from the steel frame, lower it by crane and move the machine into position. The panel is then replaced."

Foamglas insulation, a mass of sealed glass cells, is a product of Pittsburgh Corning Corp. and was used in the Irving Pulp & Paper expansion.

At the left is a view of the mill shortly after the reconstruction program, while the other picture shows a concrete-cellular glass panel being swung into place. The panels consist of 2 in. of Foamglas insulation sandwiched on either side by 2 in. of concrete.

Papertex in the U. S. sometime this fall; duPont nylon will be used exclusively.

Recent Expansions in the Industry

St. Francisville Paper Co.
of St. Francisville, La., has ordered from Appleton Machine Co. the two largest supercalenders ever made in the United Sates. Delivery of the 250-in. roll face, 370-ton machines is scheduled for the summer of 1958. They will be approximately 32 ft. wide and 33 ft. high and together will cost in excess of $1,000,000. The units will have a 10-roll complement, will obtain pressure from a pneumatic system and will handle rolls up to 72 in. in diam. (St. Francisville will produce magazine paper as a joint project of Time Inc. and Crown Zellerbach Corp.)

Hinde & Dauch Paper Co. of Canada Ltd.
will build a $1,500,000 box plant at St. Marys, Ont. Production is scheduled for the fall of 1958.

Howard Smith Paper Mills Ltd.
is now controlled by Dominion Tar & Chemical Co. as a result of Dominion's limited offer to acquire additional common shares of the paper manufacturer. In the transaction Dominion increased its holdings in Howard Smith from 33 per cent of the outstanding common to 53.5 per cent.

Union Bag-Camp Paper Corp.
has ordered a General Electric multistage mechanical drive steam turbine for its Franklin, Va. paper mill. The unit is rated at 2100 hp at 5000 rpm and will use steam at 600 psig at 750°F.

Allied News Briefs . . .

Allied Chemical & Dye Corp.'s General Chemical Div. will construct the first plant in Arkansas for the production of aluminum sulfate. Liquid "alum" facilities will be erected at Pine Bluff to supply paper mills in the area. The firm has 24 plants producing dry or liquid alum throughout the country.

Jefferson Chemical Co. Inc. of Houston, Texas, has formed a new division (Alkali Sales) to market caustic sodas and other alkalis. The move is a forerunner to production of caustic soda at the firm's chlorine plant now under construction at Port Neches. Heading the new division will be William F. Phillips, formerly of American Cyanamid Co.

Bauer Bros. Co. (Canada) Ltd. has its new plant in Brantford, Ont., in full operation. Vice president and general plant manager is W. T. Butler, formerly of Abitibi Power & Paper Co. Ltd.

Illinois Gear & Machine Co. is spending $2,000,000 in an expansion project at its South Works in Chicago. The program will double the size of the heavy manufacturing division.

Coming Events

Tappi

Sept. 11-13—Eighth Testing Conference, Shoreham Hotel, Washington, D. C.
Sept. 23-26—Twelfth Engineering Conference, Netherland-Hilton Hotel, Cincinnati
Oct. 3-4—Second Deinking Conference, Hotel Niagara, Niagara Falls, N. Y.
Oct. 7-8—Twelfth Paper-Plastics Conference, Sheraton-Gibson Hotel, Cincinnati
Oct. 23-24—Seventh Corrugated Containers Conference, Benjamin Franklin Hotel, Philadelphia

Superintendents Association

Aug. 29-31—New York-Canadian Div., Saranac Inn, Upper Saranac Lake, N. Y.
Sept. 13-14—Northwestern Div., Hotel Duluth, Duluth, Minn.
Sept. 19-21—Northeastern Div., Poland Spring House, Poland Spring, Maine
Oct. 4-5—Connecticut Valley Div. (joint meeting with New England Tappi), Curtis Hotel, Lenox, Mass.
Oct. 16-18—Southern and Southeastern Divs. (joint fall meeting), George Washington Hotel, Jacksonville, Fla.
Oct. 18-19—Penjerdel Div. (fall meeting), Pocono Manor, Pocono, Pa.

Other Meetings

Sept. 9-13—Instrument Society of America, 12th Annual Instrument Automation Conference and Exhibit, Cleveland Auditorium, Cleveland
Oct. 21-25—45th Annual National Safety Congress and Exposition, Chicago

NAMES *in the* NEWS

L. K. Merwin

D. S. Coney

Merwin Advanced by CZ

Lloyd Merwin has been elected vice president of Crown Zellerbach Corp. and general manager of converted products for the Gaylord Container Div. He was formerly Gaylord Container Corp. vice president in charge of Texas operations.

Mr. Merwin's newly created position includes responsibility for Gaylord's 62 sales offices and 17 converting plants throughout the United States. He also becomes a member of the management committee of CZ and will be located at Gaylord headquarters in St. Louis.

In another CZ appointment, D. S. Coney, resident manager of the San Leandro, Cal. converting plant, was made director of management development at the San Francisco headquarters. He was at one time personnel and safety supervisor at the Port Townsend, Wash. mill.

H. E. Whitaker

D. F. Morris

Whitaker Succeeds Ferguson at Mead

Howard E. Whitaker, since 1952 president of Mead Corp. in Dayton, Ohio, has been elected chairman of the board of directors. He succeeds Sydney Ferguson, chairman since 1948.

Whitaker remains as chief executive officer of the firm, while Ferguson continues as a director and a member of the executive, finance and policy committees.

Elected president was Donald F. Morris, first vice president since 1952. And George H. Mead was re-elected honorary board chairman, the post he has held since 1948.

In other Mead appointments, Al H. Mahrt, vice president, becomes executive vice president for finance; George H. Pringle, vice president in charge of white paper operations, executive vice president for manufacturing; Leonard R. Growdon, vice president in charge of board mills, vice president for operations; J. W. McSwiney, executive assistant to the president, vice president for development; H. T. Mead, vice president for financial relations, re-elected vice president and appointed assistant to the president in charge of converting operations.

F. S. Leinbach

C. R. Calkins

Leinbach Executive Vice President at Riegel

Frederick S. Leinbach has been elected executive vice president of Riegel Paper Corp. He was formerly vice president and general sales manager.

Leinbach has been with the firm 23 years, originally as a chemical engineer for product development at the mills in Milford, N. J.

It was also announced that Dr. C. R. Calkins has been made Riegel director of research and development. He joined the firm in 1947 as a chemist, in 1955 becoming director of research.

And Donald G. McGill, a chemist and group leader in the development laboratory, has been promoted to the position of technical director of the New Jersey Div.

Mando Appointments

J. L. Stewart, QC, of Toronto has been elected to the board of directors of Minnesota & Ontario Paper Co. to fill the vacancy caused by the recent resignation of Serge Semenenko of Boston. Stewart is a senior partner in the law firm of Fraser, Beatty, Tucker, McIntosh & Stewart.

In another Mando appointment, Henry E. Stormo was made superintendent of electric power at the International Falls, Minn. specialty paper and Insulite fiberboard mill. He also heads Rainy River Improvement Co., a Mando subsidiary that distributes power to the International Falls area. Stormo, formerly assistant superintendent of power, succeeds Oscar Sandstrom, who is retiring after 40 years of service.

William C. Rindsland has been named assistant chief engineer at International Falls to succeed Stanley C. Stratton, who is retiring after 25 years. Rindsland first joined Mando in 1947, resigning in 1952 to become associated with Rayonier Inc. Later he was works engineer for Wood Conversion Co., returning to Mando in 1956.

S. Earll Church, associate professor of pulp and paper technology at the State University of New York at Syracuse, has joined Rayonier Inc. as a technical service representative. He began his career in the paper industry in 1941 as a mill hand and millwright for Burrows Paper Co.

A. G. Wakeman, president of Coosa River Newsprint Co., has been elected a vice president of Kimberly-Clark Corp. He continues as president and chief executive officer of Coosa River, but administration will be directed by **P. A. Bachelder,** recently elected vice president. Wakeman will headquarter at the Neenah, Wis. offices of Kimberly-Clark. (Kimberly-Clark is associated with a group of newspapers in the ownership of Coosa River and

Names in the News . .

operates the plant under a long-term management contract.)

Edward W. Jones has been elected treasurer of Hamilton Paper Co. in Miquon, Pa. Formerly comptroller and assistant secretary, he has been associated with the firm more than 30 years. He succeeds Lane Taylor, who was formerly president and treasurer. Taylor has relinquished the latter post to devote his full time to the presidency.

Kermit Gardner, resident manager of the Atlanta plant of the Single Service Div. of International Paper Co., has been named southeastern district manager for the division. **Edwin B. Williams,** a former sales representative, succeeds Gardner at Atlanta.

Frederic E. Bahrenburg, plant manager for Hammermill Paper Co. in Erie, Pa., has been elected to the firm's board of directors. He succeeds William T. Brust, former vice president and assistant treasurer, who has retired after serving on the board since 1926.

F. E. Bahrenburg

John R. Fanselow

Dr. John R. Fanselow, assistant to the manager of mills for Kimberly-Clark Corp., has become an associate professor in the Department of Paper Technology at Western Michigan University. A resident of Appleton, Wis., he has been associated with K-C since 1930.

Allied Personalities

W. C. Widener, southeastern district manager for National Aluminate Corp.'s Industrial Div., retired recently after 20 years' service. He is succeeded by T. G. Cocks, formerly manager of the St. Louis district.

Robert M. Kearns and **Barclay Morrison** have been named managers of two newly established departments of the Alloy Tube Div. of Carpenter Steel Co. Kearns, former engineering and methods manager, takes charge of the engineering and planning department. While Morrison, who was specialty products manager, becomes manager of the product engineering and development department.

Sandy Hill Iron & Brass Works has announced five promotions: **Nils Klykken,** manager of the pulp machinery division, becomes vice president and manager of that division; **Albert G. Bellos,** assistant manager of the pulp machinery division, chief engineer; **George E. Clink,** assistant chief engineer and assistant manager, chief development engineer and assistant to the vice president in charge of engineering; **Edward C. Burns,** assistant chief engineer, and **James J. Fusco,** chief draftsman.

Irb H. Fooshee, vice president in charge of development, has been named executive vice president of the General Chemical Div. of Allied Chemical & Dye Corp. **James G. Fox Jr.,** director of operations, becomes vice president.

Albert Hardaker, former representative for Lockport Felt Co., has joined the sales engineering staff of Eastwood-Nealley Corp. He will be located in the South.

Frank W. Ingold, a general salesman since 1949, has been named to the newly created post of sales manager at the Cincinnati steel service plant of Joseph T. Ryerson & Son Inc.

Donald J. Wulgart, formerly with the Convair Div. of General Dynamics Corp., has joined the staff of Appleton Woolen Mills as manufacturing and development engineer. He also has held engineering positions with Mosinee Paper Mills Co. and the Institute of Paper Chemistry . . . . Appleton has also named **W. W. Jackson** as southwestern sales representative and **J. L. Minnich** as southeastern sales representative. Jackson was formerly with Alton Box Board Co., while Minnich was on the staff of Black-Clawson Co. at Watertown, N. Y.

H. J. Buechler, a member of the sales staff, has been named sales manager of Black-Clawson (Canada) Ltd. . . .In other B-C appointments, **A. E. Johnson** and **Bert Lajoie,** formerly associated with Curlator Corp., have been named to the sales and service staffs of the Pandia Div. in Hamilton, Ohio. Johnson was sales manager for Curlator, while Lajoie was a sales and service representative.

Russell T. Branch, board chairman of Stone & Webster Engineering Corp., has retired after 45 years of service with the New York, N. Y., and Boston engineering and construction firm. He has been chairman since May 1955.

New assignments in the synthetics department of Hercules Powder Co. have been announced: **Arthur C. Ketcham Jr.,** senior technical representative in the New York and Albany, N. Y., and Boston offices, has been transferred to the Wilmington branch office in the same capacity; **William L. Kitchel,** technical representative at Wilmington, to the New York, N. Y. branch office, and **Joseph O. Bradford,** technical representative in the New York sales district, to the home office as a technical representative working on sales and promotion of pentaerythritol.

Chicago Bridge & Iron Co. has announced the following appointments: **Fred L. Goldsby,** vice president and formerly general sales manager, has been named assistant to the president; **S. C. Hamilton,** formerly district sales manager at Houston, Texas, a vice president and general sales manager, and **K. W. Lange,** formerly with the firm at San Francisco, Houston district sales manager.

William Herbst, with the firm since 1952, has been made supervisor of starch application research for National Starch Products Inc. **Irving Martin,** in the research department 12 years, becomes a senior chemist.

J. W. Hemphill, for many years on the sales staff of Johns-Manville, has been named sales manager for Carthage Machine Co.

Donald B. Sparrow, formerly manager of pulp research for Scott Paper Co., has joined the staff of the Research & Development Div. of Arthur D. Little Inc. in the field of pulp and paper and related products.

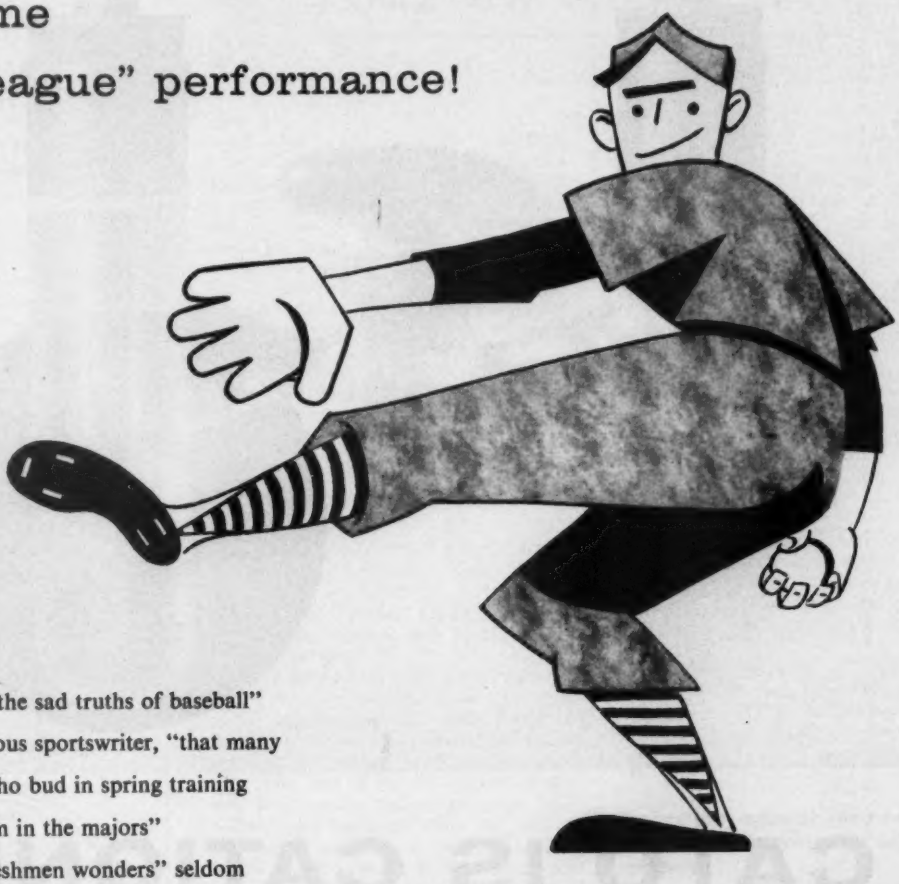
Frederick B. Winther Jr., formerly at the Milwaukee plant, has been appointed manager of sheet

(Continued on page 448)

You can't beat HAMILTON Felts . . .

for all-time

"major league" performance!



"It is one of the sad truths of baseball" claims a famous sportswriter, "that many youngsters who bud in spring training never blossom in the majors" Even the "freshmen wonders" seldom hold their pace a second year.

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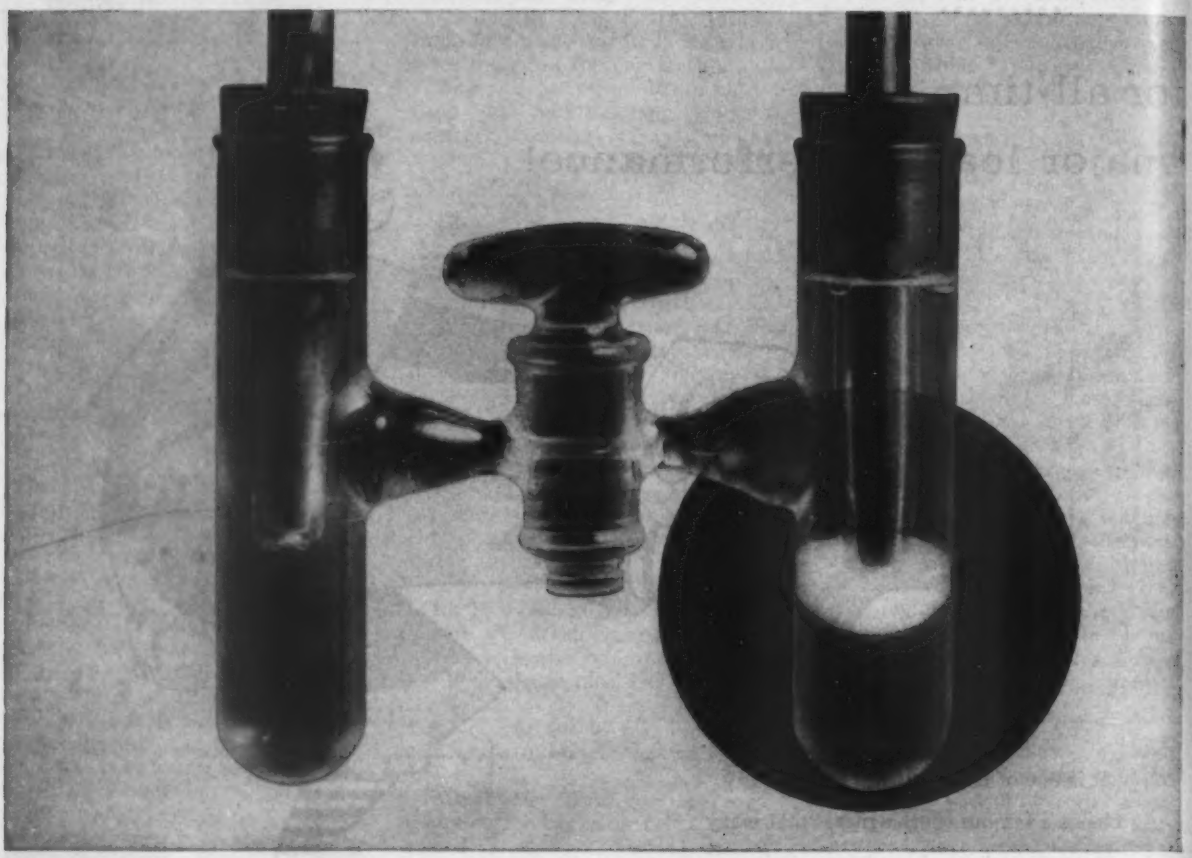

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The result is a much greater affinity of Cato to cellulose fibers which have an attraction for cationic substances. Retention is virtually 100%. Smaller amounts—¼ to ¾%—on the pulp are effective. Finish and formation are improved. Paper is stronger. Further, Cato improves the retention of pigments and fillers while maintaining or increasing strength factors.

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FOREIGN ABSTRACTS

Fiber fractionation to remove resins from sulfite pulps

By removing the ray cells rich in resins and lignin (which the authors term "O-fibers") by the use of fractionation, the pitch content of the pulp could be lowered considerably and the bleachability greatly improved. The Swiss "Attis" filter was well suited for this purpose, and the operation could be carried out at high stock density, thus furnishing a new approach to fractionation.

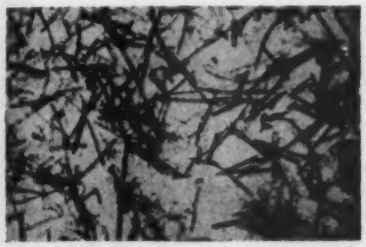

Fig. 1

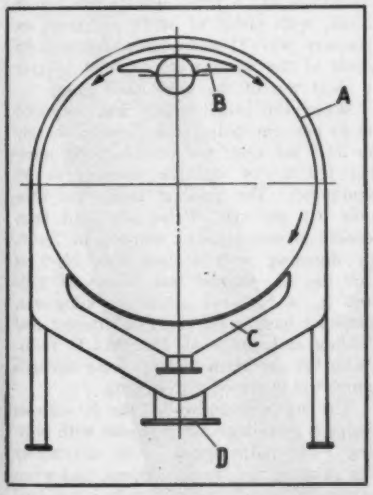

Fig. 2

Fig. 1 shows the "O-fibers" removed by 0.3 mm. mesh screens, which appeared to offer the optimal conditions for pitch removal without loss of long-fibered pulp. Usually such screening involved losses of only 4-6 per cent of the pulp with a concommitant reduction of the resin content of 50 per cent and sometimes of almost 90 per cent. Pulps from Finland, Russia, Canada, Sweden and Switzerland all gave similar results.

The ray cells (O-stuff) separated by the Attis procedure from a Finnish pulp contained about 25 per cent resins. Those from a Swiss pulp retained 10 per cent pitchy material. Such ray cells were not only high in resin; they also retained more lignin than did the tracheids, which therefor required less bleach.

The Attis filter is shown schematically in Fig. 2. A is the revolving screen; B, the inlet; C, the channel for collection, and D, the exit tube for the removal of water containing the suspended O-stuff.

Nine references and ten illustrations are given. Max Dubach and Max Rutishauser. *Das Papier 11*, 37-43 (1957) (in German, with English and French summaries).

Press section with a suction pick-up

Using the experimental paper machine of the Central Laboratory of the Swedish Paper Mills in Stockholm, a study was made of the possible application for a press section provided with vacuum transfer from the wire.

Water removal in the various parts of the press section was studied as a function of the machine speed, the basis weight of the paper, the stock freeness, of the linear pressure and vacuum at the inverted suction press, and of the dry content of the web after passing the suction couch roll.

Data were based on about 50 runs of the paper machine, in which machine speeds varied from 50 to 480 meters per minute and the basis weight of the paper from 10 to 250 grams per square meter.

Seven figures, one table and 13 references are given. Lars Jordansson. *Svensk Papperstidn. 60*, 147-152 (1957) (in Swedish with English summary).

Acetylation behavior of pulps; influence of ash components

Although the initial purpose of this study was to clarify the influence of inorganic substances on the acetylation of pulp, the investigation was extended to include the influence of carboxyl groups, the degree of polymerization, moisture, the sheet-making procedure and the effect of ageing on acetylation.

The results were evaluated on the basis of the secondary cellulose acetates formed in these experiments. When manganese acetate was added to the pulp, its acetylation behavior improved. This was also true when sodium silicate was added. On the other hand, the addition of the acetates of sodium, copper and calcium, or salts of ferrous or ferric iron gave rise to turbid acetate solutions and lowered the transparency values.

Increases in the carboxyl content or a reduction in the degree of polymerization did not impair acetylation and may actually have improved it. When the moisture content of conditioned pulp rose slightly (in one case from 6.6 per cent to 8.3 per cent), the transparency and turbidity values improved noticeably, but there was frequently an increase in the sulfur content of the acetate. Thin sheets lent themselves better to acetylation than did heavier ones.

Relatively long storage of pulps that had been pretreated with water showed a drop in transparency and a decided increase in turbidity. Although this was also true for pulps pretreated with hydrochloric acid, the effects of storage on acetate properties were less marked.

The data are given in full tabulated form. In these experiments, a commercial fully analyzed "acetate" pulp was used. For introduction of carboxyl group the pulp was oxidized either with permanganate or hypochlorite. To lower the degree of polymerization the pulp was pretreated with 20 per cent sulfuric acid at 60° for 40 min.

Thirty-four references and eight tables. Hannes Sihtola and Ermo Kaila. *Paperi ja Puu* (Finland) *39*, Special No. 4a, 143-150 (1957) (in English).

Protection against micro-organisms of carboxymethyl cellulose solutions

Many of the commercial uses of carboxymethyl cellulose (CMC) depend on the high viscosity of its solutions, which have the advantage of greater resistance to microbiological attack than that shown by most natural colloids. Thus a solution of CMC will usually keep its properties for long periods, unless exposed to extremely adverse conditions. Under such exposures, CMC solutions may turn watery and when examined under the microscope, show the growth of micro-organisms.

It was to control the development of such microbiological flora that the present study was undertaken, and various preservatives were added to CMC solutions, and their effects in impeding serious losses in viscosity were compared. The most effective preservatives were phenylmercuric nitrate or a commercial preparation containing phenylmercuric acetate and 8-hydroxyquinoline. With these, full protection was obtained in concentrations of 50 parts per million. When the addition of mercurials was deemed inadvisable, the following less active compounds could be used: dichlorophene, 8-hydroxyquinoline alone, a 1:1 mixture of sodium pentachlorophenate and borax, octachlorocyclohexanone and tetradecylpyridinium bromide. All of these gave com-

plete protection in concentrations of 0.25 gram per liter of CMC solution. When the CMC solution was likely to come into contact with exposed skin, it was advisable to to use quarternary ammonium salts or the above-mentioned pyridinium salt.

Full tabulated data are included. Lars G. Anderson. *Svensk Papperstidn. 60,* 293-298 (1957) (in English).

Better forests from better seed

This article outlines the work done in Finland by the Foundation for Forest Tree Breeding. Fig. 3 Shows the so-called "plus" trees (technically and genetically first class pines grown in eastern Finland which are reserved for seed production).

The "plus" trees may be propagated by grafting. These grafts are planted in suitable sites and widely spaced so as to form new seed orchards. Each graft retains the genetic stock of the original "plus" tree. The technique of grafting is illustrated. The top of the tree, due to the graft, gives rise to wood which is of high quality, and the base is of ordinary wood.

Fig. 3

Fig. 4

Pine, spruce, birch, hybrid aspen and hybrid larch trees are being grown. Furthermore, "chromosome" breeding is resorted to, in which wild trees having an exceptional number of chromosomes are shown to have an unusually fast growth. Tripploid birch and aspen are described briefly. Fig. 4 shows the Ruotsinkylä Forest Tree Breeding Station north of Helsinki.

Lauri Kärki, *Finnish Paper and Timber* No 2, 1957, 17-20. (in English).

Chemigroundwood from birch in newsprint furnishes

This is the first paper in a series dealing with birch pulp as a paper raw material. The drainage and wet strength properties of mixtures of birch chemigroundwood, spruce groundwood and unbleached sulfite pulp were studied on a laboratory scale.

Four chemigroundwood pulps were prepared, which differed in cooking conditions and in grinding. By applying a suction test, it was shown that with spruce groundwood the addition of the birch pulps impaired the drainage properties. A birch chemigroundwood made from more extensively treated logs showed a fairly good wet strength, and when 30-40 per cent of this pulp was added to 60-70 per cent spruce groundwood the mixture had a slightly higher wet strength than that of either component alone.

This increase however was not great enough to warrant even a partial replacement of chemical pulp by chemigroundwood in newsprint furnishes. The best quality of birch groundwood, with regard to wet strength, seemed comparable to that of spruce groundwood.

Seven figures, three tables and 117 references are included. Waldemar Jensen, Lars Nordman, and Veijo Eravuo. *Paperi ja Puu* (Finland), *39,* 4a, 165-169 (1957) (in English).

Increasing the yields of sulfite alcohol

In order to obtain high yields of alcohol from spent sulfite liquor, high yields of the sugars in this liquor by careful degassing is required.

This is feasible by using the Rhinelander continuous countercurrent method. Another prerequisite in obtaining high yields of alcohol is the effective neutralization of the spent liquor by avoiding the presence of an excess of alkali. For example, the Heidau sulfite pulp mill, located in East Germany, formerly neutralized its spent liquors with slaked lime. When they changed their technique and used causticizing slurries (consisting mainly of calcium carbonate) that were recovered from the smelt of black liquors at the Coswig straw pulp mill, it was found that they obtained a sharp increase in yields of alcohol. These amounted to a rise from the initial 71.4 to 85.3 liters of alcohol per ton of bleached sulfite pulp (on the oven dry basis), or an increase from 9.9 to 12.1 liters per cubic meter of barked sprucewood. In the future, with suitable utilization of mill effluents, 100 liters per ton of pulp is expected.

A marked advantage in the use of causticizing slurries in neutralization is the rapid and more effective clarification of the spent liquors, even when these have been obtained from a hard sulfite cook. These causticizing slurries may be replaced in part (up to about 20 per cent) by certain slurries obtained in beet sugar manufacture; these contain about 65 per cent calcium carbonate and appreciable amounts of such nutrients for yeasts as phosphates, potassium and nitrogenous materials. Some data on costs are included.

Two tables and 11 references are given. G. Kretzschmar. *Zellstoff u. Papier* 4, No 2,35-9 (1957) (In German); through *B.I.P.C.* 27, No 9,966 (1957).

Pulp from Eucalyptus rostrata grown in Israel

This wood resembles Australian *Eucalyptus regnans* in its fiber dimensions and chemical composition, rather than the *E. rostrata* grown in Australia. It could be pulped satisfactorily by the kraft process.

The following conditions were used: a wood-to-liquor ratio of 1:3 (or 3.4), a maximum temperature of 150-60 deg. C, 14-15 per cent alkali (as Na_2O), 25 per cent sulfidity; the time required to reach maximum temperature was 90 min. and the digestion period was 1½ to 3 hours. The unbleached pulp obtained under these conditions had a permanganate number of 22-28, with yields of 50-51 per cent; its viscosity was 71 centipoises. About 1.35 cords of the wood were required to give 1 short ton of the unbleached pulp.

When the initial alkali was increased to 22 per cent, pulp yields dropped sharply to 41.6 per cent; the permanganate number fell to 14 and the viscosity to 33 centipoises. The residual ligin was then only 2.5 per cent. Pulps that had been cooked to permanganate numbers of 23-27, by digesting with 15 per cent Na_2O at 160 deg C., showed tear factors of 130-140 g., a burst of about 83 kilograms, breaking lengths up to 11,000 meters and folding endurances of over M.I.T. folds. With the exception of tear, these strength properties increased with beating.

The air permeability of the *E. rostrata* pulps is quite high but decreases with beating. The pulps appear to be satisfactory for printing and for fine papers, and when unbleached coniferous kraft pulp is admixed with the eucalyptus pulp, wrapping paper of various grades can be produced. The usual three-stage bleaching processes gave satisfaction, but the highest brightness was obtained by bleaching in four stages (using two hypochlorite steps). In this case a relatively high viscosity (29 centipoises) was maintained, and the G.E. brightness was 80-81 per cent. The amount of chlorine required for a full bleaching operation was 10-12 per cent, based on oven-dried pulp, which lost about 11 per cent of its original (dry) weight. Thus bleached pulp yields, with 80-83 per cent brightness, were about 45 per cent. In the final hypochlorite

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Appleton felts

stage, the addition of bromides appears to permit reduction of the time and temperature of bleaching and gives higher viscosities at the same brightness. The rate of beating, strength and bulk properties decrease relatively little on bleaching; the air permeability increases. The opacity of the bleached pulp is relatively high.

Twenty-seven tables, 15 graphs and 20 references are included.

M. Lewin and Lengyel. *Bull. Research Council Israel* **5C**, 181-214 (March-June 1956) (In English); through *B.I.P.C.* **27**, No 10,1105-6 (1957).

Fiber-to-fiber bonding in handsheets

The characteristics of fiber-to-fiber bonding has been made visible in electronmicrographs in wood fibers and in hand sheets made from them. This appears to be the first time that this has been accomplished.

Using wood that had not been dried (*i.e.* in the original "biological state"), various kraft pulps were prepared, and these are characterized by the presence of lamellas made up of fibrils, which may extend from one fiber to another, forming bonded areas that bind the fibers to each other. Apparently when these pulps are beaten or when drying takes place, the properties of the sheet are radically changed, as indicated by the usual testing methods.

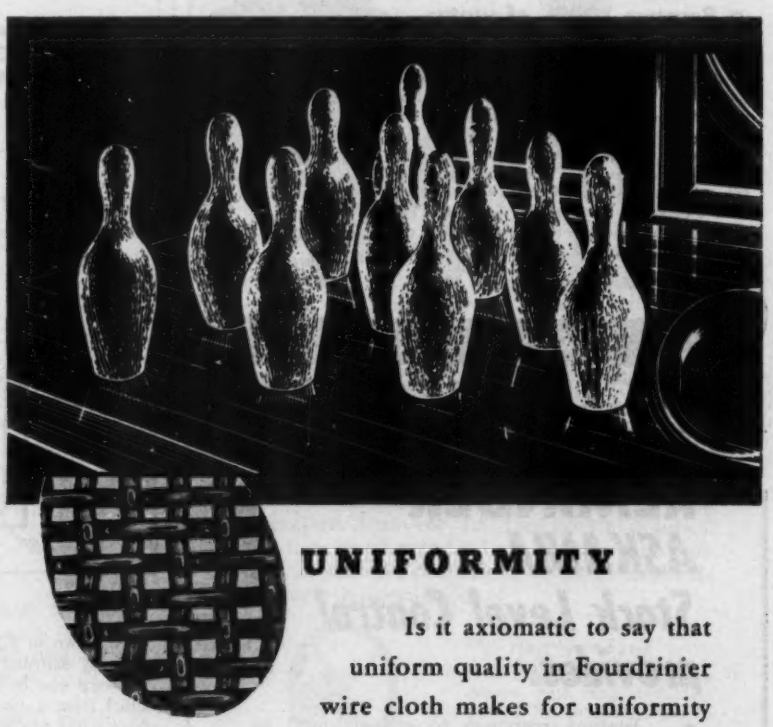
Fig. 5

Fig. 6

A series of electronmicrographs shows the bonded areas between fibers. As an example, Fig. 5 shows these fibrillar bonding between two spruce (unbleached) kraft fibers, prepared from material in the biological state. A similar bonded area (under some tension) is shown in Fig. 6. The role of laterally oriented bonding by microfibrils is discussed.

In the kraft digestion (which was used in the present study), the primary wall is partially torn away, and the fibrillated lamellas from this part of the cell contribute considerably to the bonding between fibers. The network in such areas are of significance in their effects on the folding endurance of the sheet. When such "biological" pulps are beaten, even for relatively short periods, the microfibrils are either twisted or torn and the folding endurance drops. The question (frequently raised in the past) as to whether bonded areas are due to "fibrillation" or to a "cementing" action, appears to be an idle one. In all cases, microfibrils are involved in one way or another. When a dried pulp sheet is again subjected to beating, the fibrils that have suffered irreversible hornification are ruptured, and they then can contribute very little to strength in a newly formed sheet. In fact, whenever the microfibrils undergo this hornification, sheet strength is impaired.

Fifteen photo- and electronmicrographs are included. Georg Jayme and Günther Hunger. *Das Papier* **11**, 140-145 (1957) (in German with English summary).



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PATENT REVIEWS

MELVIN NORD*

Liquid-resistant woven paper materials

U. S. 2,787,045, issued April 2, 1957, to Joseph V. Crawford and assigned to Laurel Plastics Inc., relates to a method of making high-strength woven paper materials which are highly resistant to aqueous and organic liquids and which will not pick up electrostatic charges.

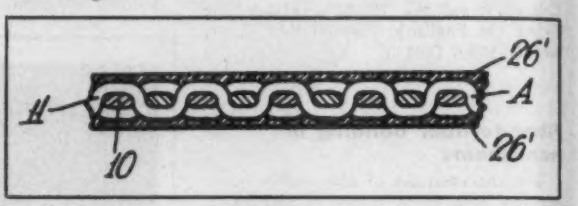

Fig. 1

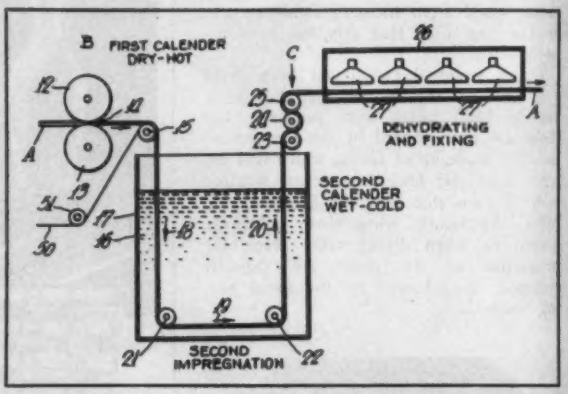

Fig. 2

As shown in Figs. 1 and 2, the woven paper material A has a relatively flattened filling 10 and a rounded warp 11. The filling and warp may be formed of twisted half-inch wide strips of paper slitted from a 12- to 16-lb. weight of paper with a thickness of about 0.004 to 0.008 in. Both the warp and the filling are twisted and then passed through a water wax solution. The strips are given from 2 to 4½ turns per inch.

The woven fabric A is then subjected to 400-500 psi pressure between the high-pressure rollers 12 and 13 at a temperature of 300-450°F. This results in a substantial flattening of the fabric as indicated at 14 and results in the wax emulsion being thoroughly dispersed throughout the paper strands of woven fabric A. Then the paper passes over the guide roller 15 into the bath 16 in the vessel 17. The bath contains about 10 per cent of a polystyrene latex and 10 per cent of a water-dispersed resinous material. The paper passes through the bath under rollers 21 and 22 and is then subjected to a wet pressure treatment by the calender rolls 23, 24 and 25 using 110 lbs. and resulting in a thorough impregnation of the coating material. Finally the paper material is passed into a drying chamber 26 where it is subjected to infra red lamps 27 which effectively fix the coating and impregnation on the paper stock.

Process for monosulfite recovery

U. S. 2,789,883, issued April 23, 1957, to William S. Cook and assigned to West Virginia Pulp & Paper Co., describes a process

*Patent attorney, 17600 Pinehurst, Detroit 21.

for converting smelt liquor containing sodium sulfide and sodium carbonate to liquor containing sodium sulfite suitable for cooking wood by the mono-sulfite method.

The smelt liquor is carbonated with CO_2, forming sodium carbonate and releasing the sulfur as H_2S. The H_2S-bearing stream of CO_2 is then oxidized with SO_2, converting the H_2S to elemental sulfur. After the sulfur is removed, the stream of CO_2 is enriched with SO_2, and this enriched stream is used to sulfite the carbonated smelt liquor. This converts the carbonates in the smelt liquor to sulfites and yields CO_2 for use in the carbonation of a fresh supply of smelt liquor.

Testing softness of paper products

U.S. 2,786,352, issued March 26, 1957, to John T. Sobota and assigned to Fort Howard Paper Co., describes a method of testing the softness of paper products such as paper napkins, facial tissue and toilet paper.

A sheet of the paper to be tested is placed over a hole in a support, and spherical weights of progressively increasing amount, of a diameter smaller than the hole, are placed on the paper until a weight causes the sheet to be driven a predetermined distance into the hole.

Production of resins from ammonium-base sulfite waste liquors

U.S. 2,786,008, issued March 19, 1957, to Robert J. Herschler, assigned to Crown Zellerbach Corp., describes a method of producing resin compositions from ammonium-base sulfite waste liquors and phenol-formaldehyde resins.

Such compositions may be used in molding or in the fabrication of fiberboard or plywood. The use of the ammonium-base sulfite waste liquor not only does not degrade the properties of the composition, as does calcium-base sulfite waste liquor, but actually improves it in a number of ways. Thus, it imparts a high degree of water-, alkali-, acid- and solvent-resistance to the molded or fabricated product. Also, it imparts a relatively fast cure time. It also controls the flow properties of the mixture so that it flows rapidly during the initial stages and then sets rapidly to a hard, infusible product.

Refining of wood pulp

U. S. 2,789,902, issued April 23, 1957, to George W. Seymour, Morris Wayman and Helge P. Holkestad, assigned to Celanese Corp. of America and Columbia Cellulose Co., describes a process of refining wood pulp which reduces the resin content of the wood pulp to an extremely low value.

Digested wood pulp is subjected to a hot alkali boil in the presence of a non-ionic detergent consisting of a polyglycol ether of an alkyl phenol and tall oil.

Method of operating a chemical recovery smelter furnace

U. S. 2,789,881, issued April 23, 1957, to Frank W. Hockmuth Inc. and assigned to Combustion Engineering Inc., provides an improvement in the design of a furnace for recovery of chemicals from black liquor.

The object of the invention is to provide a water-cooled furnace bottom which will enable drainage of the hot smelt from the furnace without destruction of the furnace bottom through corrosive and erosive action.

Pulp manufacture

U. S. 2,788,273, issued April 9, 1957, to Philip E. Shick and assigned to Mead Corp., describes a method of producing paper pulp from wood by cooking with sodium salts of sulphurous acid and recovering the sodium and sulphurous components for reuse.

The spent cooking liquor is first concentrated in a triple-effect evaporator to 50-65 per cent total solids, of which approximately 40 per cent are inorganic and 60 per cent are organic constituents.

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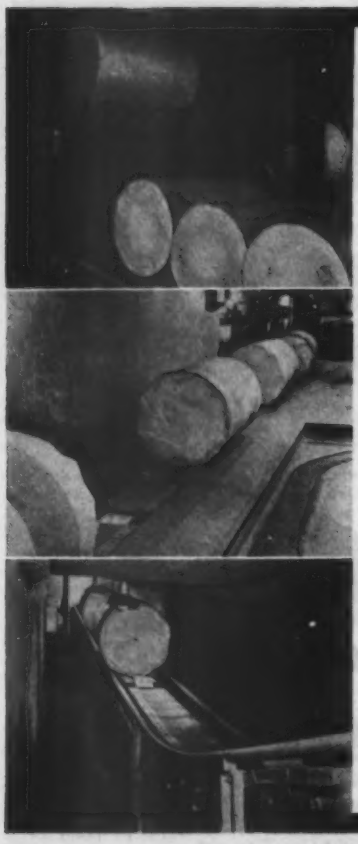

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Patent Reviews . . .

The concentrated spent liquor is then subjected to a combustion in a Wagner spray-type recovery furnace, introducing controlled amounts of air at the inlet ports, so that a reducing atmosphere is maintained at the bottom and an oxidizing atmosphere at the top. The organic constituents are thus oxidized to gaseous carbon compounds and water, and the sodium and sulphur compounds are converted to sodium sulphide, sodium carbonate and sulphur dioxide.

The sodium compounds are thus recovered in a concentrated water solution. The sodium sulphide in this solution is treated with a limited portion of the gaseous products of the combustion step in a direct gas-liquid countercurrent carbonation step. H_2S-rich gases leaving this tower are recycled to the upper or oxidizing portion of the combustion furnace where the H_2S is converted to SO_2.

The SO_2 leaving the combustion furnace is absorbed in the carbonated liquor mentioned above, resulting in a fresh cooking liquor.

Method for treating paperboard

U. S. 2,789,921, issued April 23, 1957, to Sol Chaftan, provides a method of producing paperboard having fibers which are saturated with rosin to make the board thoroughly water-resistant, fire-retardant and high in strength and rigidity without requiring heat or pressure in the process.

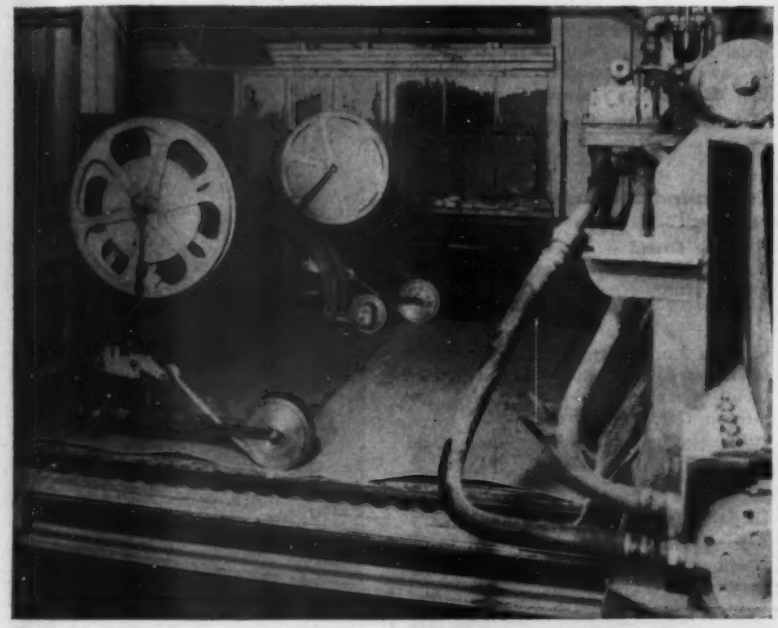
A solution consisting of an organic solvent, such as methyl ethyl ketone and rosin (20-30 parts by weight per hundred parts of solution) is prepared. The paperboard is immersed in this solution for 2-3 sec.

Paperboard thus treated will exhibit strength and rigidity within 24 hrs., but to stabilize it against changes in atmospheric conditions it is immediately dipped into a second bath containing methyl ethyl ketone and 10-20 parts by weight of a methyl methacrylate polymer per hundred parts of solution.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Formation of crumpled paper filter elements	Veyne V. Mason et al.	2,786,399	3/26/57
Paperboard carrier for cans	Atlanta Paper Co.	2,786,572	"
Cartons	David Levkoff et al	2,786,621	"
Multi-ply paper sacks	Midway Paper Sacks Ltd.	2,786,622	"
Valve bag	Olin Mathieson Chemical Corp.	2,786,623	"
Preparation of paper from a siliceous pigment	Columbia-Southern Chemical Corp.	2,786,758	"
Method of beater saturating fibers with hard, nontacky resins	Arthur E. Carlson	2,786,759	"
Gummed paper	Armstrong Cork Co	2,786,789	"
Machine for removing bark from logs	Per Gunnar Brundell and Karl-Erik Arnold	2,787,304	4/ 2/57
Convertible display carton	New Haven Board & Carton Co.	2,787,371	"
Bulk bag pack	William G. Sheard	2,787,372	"
Refrigeration package	Refrigeration Package Spacers Inc.	2,787,407	"
Quick set-up folding container	Noble Andre	2,787,408	"
Multi-unit container	Clarence W. Vogt	2,787,409	"
Machine for forming folded paper towels	West Disinfecting Co.	2,787,462	"
Glass paper	L.O.F. Glass Fibers Co.	2,787,542	"
Tea Bag	Eppens, Smith Co.	2,787,548	"
Collapsible carton	Birmingham Paper Co.	2,788,168	4/ 9/57
Apparatus for forming moisture-proof gussets	St. Regis Paper Co.	7,788,720	4/16/57
Production of corrugated paperboard pipe covering	Nicolet Industries Inc.	2,788,840	"
Apparatus for pleating and heat-treating paper	Fram Corp.	2,788,841	"
Folding-box blanks with provision for accurate stacking	Robert Gair Co. Inc.	2,788,931	"

NEW PRODUCTS



Solving the splitting problem of edge-glued veneer

A solution for the splitting problem of edge-glued veneer has been developed at the Plylock plant of the Simpson Logging Co.

The equipment needed for this application can be installed by your own millwright at a minimum of expense.

The following features are offered by this equipment: 1. Virtually eliminates the splitting of face and back stock as it comes off the edge-gluer, in handling and in the lay-up operation. 2. Does away with reject veneer due to splitting. 3. Saves approximately 20 per cent of the labor costs in your panel patching operation.

Complete technical information concerning this application is available. *Crown Zellerbach Corp.*

Circle No. 11 on Readers' Service Card

These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Mobile radio units

Using all-electronic power supplies, a new line of mobile radio units is now available to the industry.

Called the "T-Power" radiophones, the new two-way radio units incorporate a transistorized switching circuit in the power supply in place of the conventional vibrator. Thus eliminating the vibrator.

Installation versatility is offered with these units. The radio drawer is interchangeable between dash- or trunk-mounted installation. The models can be supplied with either conventional squelch or as private-line radiophones. *Motorola Inc.*

Circle No. 12 on Readers' Service Card

Ultrasonic emulsifier—makes liquids produce the sound waves

The manufacturer of a new line of ultrasonic emulsifiers states that an entirely new principle of operation is used which has resulted in considerably less expensive and easier-to-maintain machines compared with past equipment. It also offers faster and more complete emulsification.

The new line includes: the Rapisonic, the Autosonic, the Dispersonic and the Minisonic. These machines use the fluid-dynamic forces of the liquids themselves to produce the sound waves, instead of

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The company invites your requests for complete technical information on this system. *Sonic Engineering Corp.*

Circle No. 13 on Readers' Service Card

Automatic ac variable speed system

A variable speed, multiple drive system has recently been developed that can be automatically controlled in response to a variety of input signals. This new system combines varidyne, consisting of a varidyne power unit and one or more ac induction motors, and varitrol—an automatic pneumatic control system. *U. S. Electrical Motors Inc.*

Circle No. 14 on Readers' Service Card

Automated conveyor system

Designed for a multitude of applications in varied industries for moving heavy rolls, skids, pallets and similar loads is a recently introduced automated conveyor system.

The system is mounted into the floor, flush to floor level. Powered electrically, all controls, conveyors and turntables can be adapted to a variety of applications where banding, tying and similar operations are now being done manually. For example, in a banding and weighing line (such as is illustrated in the picture above) the entire operation can be done automatically with one operator.

The unit shown in the picture above is installed at a paper mill in the Southeast. It shows the roll moving over the weighing unit. *Engineering Products Co. Inc.*

Circle No. 15 on Readers' Service Card

Compound for corrosion removal

Oakite Drycid is a new powdered acid material which removes rust, scale and corrosion with greater safety to metal surfaces as well as personnel.

Added to water in concentrations upwards of 8 oz. to the gallon, Oakite Drycid is said to go into solution fast and to be useful in applications by circulation or immersion. *Oakite Products Inc.*

Circle No. 16 on Readers' Service Card

Impact tester for paper

A new impact tester has been designed which employs a technique to obtain the most reliable measurements of impact strength yet recorded for plastics, paper, boxboard and similar materials.

Impact strength is found on the instrument by measuring the energy lost by its swinging pendulum when it breaks through a sample. Energy of the pendulum on an uninterrupted swing is compared to its energy after breaking the sample.

Other technical information on the unit's makeup and function is available from *U. S. Testing Co. Inc.*

Circle No. 17 on Readers' Service Card

Accessory permits direct determination of mixing horsepower

A new dynamometer accessory for the ELB experimental agitator permits the user to directly determine required horsepower for mixing non-Newtonian fluids and gas-liquids.

The photo above shows the structure of the unit. Motor torque is transmitted through the arm to the pan of a laboratory scale, where the amount of the force is displayed in pounds.

Horsepower is determined accurately and simply by substituting derived values in the standard horsepower formula. Illustrated technical data may be obtained from *Chemineer Inc.*

Circle No. 18 on Readers' Service Card

Intercommunication system

The unit pictured above shows the newly-developed intercommunications system for the industry.

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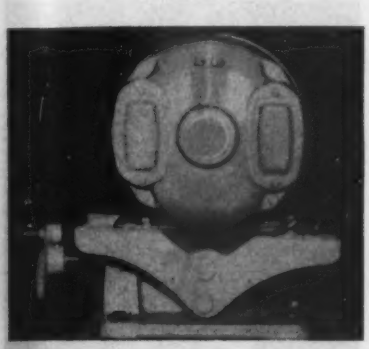
clock. The system uses no tubes, and the transistor circuit will last indefinitely, providing exceptionally dependable and economical performance, according to the company.

Units are finished in blended gold, polished and satin silver tones. *Talk-A-Phone Co.*

Circle No. 19 on Readers' Service Card



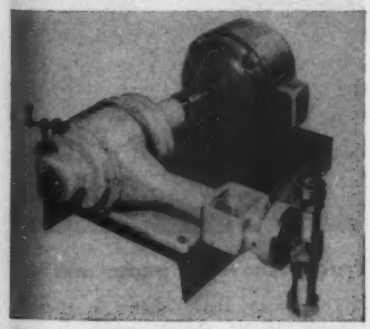
Tilting motor base

The photo above shows a motor mounted on a new tilting motor base which has recently been developed.

In designing the unit the tilting movement was the main feature. This movement compensates for belt tension when speed changes are made while the machine is running. It also makes belt changing an easier operation.

The actual base size is 5½ in. × 7½ in. Only one size base is used for all fractional horsepower motors. *Lovejoy Flexible Coupling Co.*

Circle No. 20 on Readers' Service Card



Heavy-duty proportioning pump

Here is a heavy-duty proportioning pump featuring stroke-length adjustment of capacity in all sizes. Pump stroke length can be adjusted from 0 to maximum while running. The pump pressures up to 16,500 psi. *Capacitrol Pump Co.*

Circle No. 21 on Readers' Service Card

Aluminum cast flexible coupling

A new aluminum cast flexible coupling using a one-piece, spider-type load cushion is stated by the manufacturer to combine light weight, extra-long service life and negligible maintenance.

Some of the features include: lubrication never required; the load transferred entirely by cushion compression, thus eliminating wear and abrasion on the metal jaws; since only the load ends are under compression on non-reversing loads, the entire spider may be reversed for double service-life, and cushions are plainly visible for quick inspection at all times. *Lovejoy Flexible Coupling Co.*

Circle No. 22 on Readers' Service Card

Double-reduction speed reducers

Four new and improved standard primary double-reduction units have been developed and added to the extensive line of cone-drive double-enveloping worm gear speed reducers.

The new primary units are available in center distances of 2, 2½, 3 and 3½ in. Coupled with the proper secondary, they provide reductions from 25:1 to 3500:1. *Michigan Tool Co.*

Circle No. 23 on Readers' Service Card

Three-inch PVC pipe union

The photo above shows a plastic 3-in. screwed pipe union which has been introduced to the market.

It is designed for application with PVC piping systems which are successfully used to handle corrosive fluids. Tight seal against flow leakage is provided by the three-part union.

The new 3-in. union is available with threaded or solvent-weld socket-type ends in either high- or normal-impact PVC. *Walworth Co.*

Circle No. 24 on Readers' Service Card

Rubber lining for storage tanks

Two storage tanks used in a paper mill to store liquid alum have been lined with Triflex since 1940 and have been stated to be in excellent condition without any repair work.

Triflex lining is of sandwich construction consisting of a hard rubber layer between two layers of soft rubber. A special lap seam allows for expansion and contraction of the hard rubber. The hard rubber edges do not meet. Instead, they

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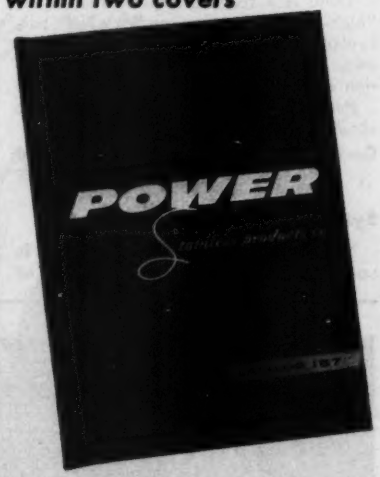

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Only a distributor such as Power that sells the most comprehensive stock of stainless steel pipe, tubing, valves, fittings, and specialties could possibly compile such a wealth of information. Now it's here . . . and it's what you've been clamoring for — the first hard-cover catalog so complete it'll soon become the "bible" of the corrosive and allied industries!

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overlap and float in a cushion of soft rubber. Regular Triflex can be vulcanized with steam or hot water at temperatures as low as 212°F.

More information concerning this type of lining is available from *B. F. Goodrich.*

Circle No. 25 on Readers' Service Card

Tool for opening cases and cartons

A new patented cutter called the Stesco Safety Cutter uses any standard single-edge razor blade to cut cardboard, corrugated paper and cloth.

There is a recessed imprint area on its "high-impact" styrene handle which particularly suits this safety cutter as a give-away, premium, dealer loader or combination offer item.

Further details and a free sample are obtainable. *Gimmix Unlimited.*

Circle No. 26 on Readers' Service Card

Synthetic coating for paper

Nacromer YNC is a synthetic which is said to produce a lustre that is equal to or greater than the finest grades of natural pearl essence.

In concentrated paste form, the coating mixes easily with most coating materials and can be applied by spray, brush or dip. No additional equipment or finishing operations are required for applying a Nacromer YNC coating.

The company offers demonstration samples showing actual Nacromer YNC coatings at your request. *The Mearl Corp.*

Circle No. 27 on Readers' Service Card

Compact photoelectric relay

Tri-tronics miniature photoelectric relay is a unit designed to provide the features most desirable for industrial use.

The unit plugs into a 120-v line and works without tubes or transistors.

$35.00 is the price which the company has quoted for the relay. It mounts on a standard ½-in. conduit hub and is ready to operate. Plug-in and splice box type are offered. *Tri-Tronics Co.*

Circle No. 28 on Readers' Service Card

Web conditioner controls addition of moisture to paper

A web conditioner for controlling the amount of moisture to the paper web has been announced.

The conditioner comprises a steel enclosure slightly wider than the web to be conditioned and approximately 38 in. high and 16 in. thick. It is mounted in the path of the goods at any convenient location, and the web travels vertically through it, entering and leaving through slots at the top and bottom, respectively. Models are also available for horizontal web travel. *J. O. Ross Engineering Corp.*

Circle No. 29 on Readers' Service Card

Adjustable motor base

With the Adjusto-Slide motor base (pictured above), belt take-up is accomplished by adjusting only one screw. This adjustment is safely made without stopping the motor.

The slide can be mounted vertically, horizontally or in an inclined position. *American Pulley Co.*

Circle No. 30 on Readers' Service Card

Tractor shovel in paper mill

The photo above shows a 16-cu.-ft. capacity tractor shovel, which is now being used in a paper mill to solve a materials-handling problem of picking up sulfur from storage bin to be dumped into a hopper car. This car is then pulled up a steep incline for the dumping of the sulfur into the burner.

The tractor shovel is called the Michigan Model 12B manufactured by *Clark Equipment Co.*

Circle No. 31 on Readers' Service Card

Gravure press

A new gravure press designed especially for American converters of flexible packag-

Uniform, Clean-Cut CHIPS with Minimum Fines Minimum Bruising Minimum Maintenance

Carthage-Norman Chipper

The unique variable bevel of the knives and helicoidal surfaces of the disc permit the Carthage-Norman chipper to pull the log in at exactly the correct rate for a clean, sharp cut at all points along the cutting edge.

Consequently, at least 70% of the chips are at the specified length, sawdust is up to 1% less (a saving of $15,000 to $30,000 a year), and there is minimum bruising. Maintenance costs on the Carthage-Norman Chipper are exceptionally low.

CARTHAGE *Write for Bulletin CNC-1*

MACHINE COMPANY CARTHAGE, NEW YORK

ing materials is ready for the market.

The new press, which is called the "Series R" Rotopackager, is designed for profitable use by small as well as large converters.

"Series R" is made in printing widths of 30 in., 32 in., 36 in., 40 in. and 42 in. and is also a unit-style press with exceptionally large working space between units. *Parsons & Whittemore Graphic Corp.*

Circle No. 32 on Readers' Service Card

Powered dock ramp

The ramp pictured above is especially designed for low docks commonly found in older buildings.

Use of the new ramp eliminates expensive alterations to the dock. It is simply bolted to the dock surface. The ramp is made of steel and is hydraulically operated.

The standard model is 5 ft. wide and 19 ft. long and is available in 6000-lb. and 12000-lb. capacity. *Copperloy Corp.*

Circle No. 33 on Readers' Service Card

Protective covering for paper rolls in outdoor storage

Individual protective coverings for paper rolls have been designed for use when storing out-of-doors.

The company has stated that these coverings give positive protection against rain, fire, snow, mildew and moisture. The reusable canvas cap method provides a cheap, practical and easy way of storing rolls.

The photo shows these covers now in use at a paper mill. *Hoosier Tarpaulin & Canvas Goods Co.*

Circle No. 34 on Readers' Service Card

PVC drainage systems for handling corrosive liquid wastes

Announcement has been made of the availability of polyvinyl chloride pipe and drainage fittings for complete PVC drainage systems to handle corrosive liquid wastes. The PVC drainage lines require no painting and are unaffected by soil conditions or galvanic action. Drainage joints made with solvent cement applied with a paintbrush are permanent and successfully withstand vibration. *Alpha Plastics Inc.*

Circle No. 35 on Readers' Service Card

New type of emulsion for coatings

A complete new type of emulsion called Flexbond 100—a copolymer of vinyl acetate and vinyl stearate—is now available to the industry. Film properties of Flexbond 100 include unusually high water-resistance; fine particle size; clear, transparent film; permanent flexibility; excellent adhesion; non-toxicity, and greaseproofness.

The transparency, flexibility and adhesion of the film recommends the applications of Flexbond 100 in the paper coating field.

A bulletin giving more technical details of Flexbond 100 is offered by the *Air Reduction Co. Inc.*

Circle No. 36 on Readers' Service Card

Chain saw

A manufacturer of chain saws has announced a low-priced saw which will retail for $165.00. The saw is called the MAC 35.

This saw features an aircraft-type diaphragm carburetor for all position cutting, a weatherproof ignition and an automatic rewind starter.

Attachments such as a drill for stump blasting, a plunge bow for pulp cutting

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The National Safety Council maintains a stock of posters that covers all industries, operations and phases of safety and health. These posters are produced in three sizes: "A" size, 8½" x 11½"; "B" size, 17x23"; and "C" size, 25x38". Their colorful illustrations and eye-catching captions make them ideal for the mass selling of safety.

Write for a free copy of the Directory of Occupational Safety Posters. This 72 page catalog illustrates 744 posters, indexed and classified for specific operations.

NATIONAL SAFETY COUNCIL

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and a brush cutter will be available for the unit.

MAC 35 offers three blade sizes: 12-in. at $165.00; 16-in. at $172.00, and 20-in. at $179.00, all f.o.b. factory. *McCulloch Motors Corp.*

Circle No. 37 on Readers' Service Card

Electrical ground faults found with new ground detector unit

Testing ungrounded and modified grounded circuits from 0 to 2300 volts while circuits are hot and equipment is operating can be done with this new high-voltage ground detector unit.

The detector consists of a portable generator and a hand-held signal receiver. The generator impresses a pulsating signal of line voltage on the grounded phase conductor. This signal is followed visually with the receiver to the ground fault, where the meter ceases to pulsate. *Excel Electric Service Co.*

Circle No. 38 on Readers' Service Card

Converter press for gravure printing

A new heavy-duty gravure converter press has been designed to offer printing widths of 44 in. (Model 44) or 54 in. (Model 54), both of which accept cylinders from 20-in. to 40-in. circumference. Operational adjustments and job changeover are facilitated by complete walk-in accessibility between color units.

The new design features: fully-enclosed dual inking system; a full-range doctor blade; hydraulic impression mechanism, and unit construction extended to the drive section. *Champlain Co.*

Circle No. 39 on Readers' Service Card

Check valve with renewable disc

A new renewable composition disc bronze swing check valve has been announced.

Renewable composition discs, which protect the valve seat from damage due to solid particles in the steam and from the shocks of pressures, afford considerable savings in replacement costs to users.

The composition discs are regularly furnished in a medium-hard type for liquid service, and steam discs are also available. *Farbanks Co.*

Circle No. 40 on Readers' Service Card

Instrument which will measure level of viscous fluids

A new differential pressure liquid level transmitter, called Type 13 FA d/p Cell Transmitter, mounts directly on a tank nozzle to provide a simple method for measuring viscous or slurry-type liquids in open or closed vessels. The unit operates on the force-balance principle and maintains calibrated accuracy over a wide range of ambient conditions.

The manufacturer states that this unit will measure the level of difficult fluids in pulp and paper manufacturing. It also has application for blow tank level, brown stock washer filtrate tank level, stock level and seal boxes. *Foxboro Co.*

Circle No. 41 on Readers' Service Card

Miniaturized dust-collector

Joy Microdyne is the name given to a new cylindrically-shaped, wet-type dust-collector. It is stated to be 1/20th to 1/10th the size of any comparable unit and capable of collecting over 99 per cent of dust particles of 5 microns and larger.

The company will produce the unit in a standard line ranging from 2500 cfm to 64000 cfm. Special applications will be handled on a custom basis. *Joy Mfg. Co.*

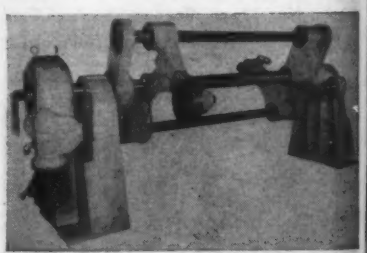
Circle No. 42 on Readers' Service Card

Portable unit for hydrostatic testing process equipment

This unit, called the Porta-Tester, has been developed for general industrial use in at-the-site hydrostatic tests of valves, pressure vessels, piping, steam generators, pump cases and other process equipment to pressures up to 3000 psi.

Weighing only 55 lbs., the portable unit is only 18 in. × 8 in. *Farris Engineering Corp.*

Circle No. 43 on Readers' Service Card



New unwind has adjustable arms

Model 42-100 is a new continuous, shaftless rotating unwind stand which is pictured above. The stand is made for continuous operation on paper and board on operations such as coating, saturating, laminating and corrugating.

The principal feature of the machine is that different roll widths can be run successfully without stopping the process for set ups. Each set of arms can be independently adjusted for roll widths either by manually moving the arms or by a power screw attachment.

Rolls up to 50-in. diameter by 100-in. face can be accommodated. Pressure rolls and cut-off knife can be added for full-speed flying splices. *Black-Clawson Co.*

Circle No. 44 on Readers' Service Card

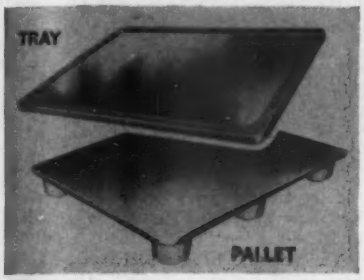
Automatic-drain air line filters

New automatic-drain air line filters with simplified design of drain mechanism, more

efficient liquid removal and a wider pressure and temperature-operating range have been announced by the manufacturer. Also new is the addition of metal bowl automatic-drain filters.

Further information showing the complete line and technical makeup of these filters is available from *C. A. Norgren Co.*

Circle No. 45 on Readers' Service Card



Plastic pallets

An all-new line of plastic pallets, skids, shipping trays, assembly line trays and flexible stacking paltiers has been completed and ready for the market.

Some of the many advantages in using plastic units are: no nails, screws, etc. that may injure personnel or damage products; elimination of practically all maintenance; they will not warp, crack or sag; will not absorb moisture or odors; are free from rot, corrosion and insects, and pallets of a given type and size are uniform in weight, permitting simplified load inventory.

The company invites your requests for information about this complete line. *Paltier Corp.*

Circle No. 46 on Readers' Service Card

Extra capacity compressor

According to the manufacturer, a new compressor called the ADL-1000 will eliminate the need to buy a second compressor when only slightly larger air capacity is needed.

The ADL-1000 is a two-stage, air-cooled, 20-hp., two-cylinder vertical compressor. In continuous service, it has a piston displacement of 100 cfm at 870 rpm and a discharge pressure up to 150 psi. On intermittent service it has a discharge pressure as high as 250 psi. Complete details are obtainable from *Gardner-Denver Co.*

Circle No. 47 on Readers' Service Card

Bondable Teflon

A bondable Teflon has been developed which has overcome the problem on many applications where it is desired to adhere Teflon to itself or other materials.

The company is now surface-treating Teflon sheets and tapes for bonding purposes, and good bond strengths have been obtained between aluminum, mild steel, wood, plastic and other rigid materials. The company states that bondable Teflon should prove most valuable for lining or covering rolls, pipes, tanks, machine parts and other similar applications. *Abbott & Biddle.*

Circle No. 48 on Readers' Service Card

Packaging adhesive for polyethylene

A new packaging adhesive, No. 3679-H Polygriptex, has been developed which will substantially increase the use of polyethylene for packaging.

It is possible to adhere labels to polyethylene squeeze bottles, polyethylene containers and also to adhere polyethylene as easily as cellophane to paper, chip or kraft board in the manufacture of packaging, envelopes, polyethylene bags and boxes.

The company states that the adhesive has superior aging qualities. *Adhesive Products Corp.*

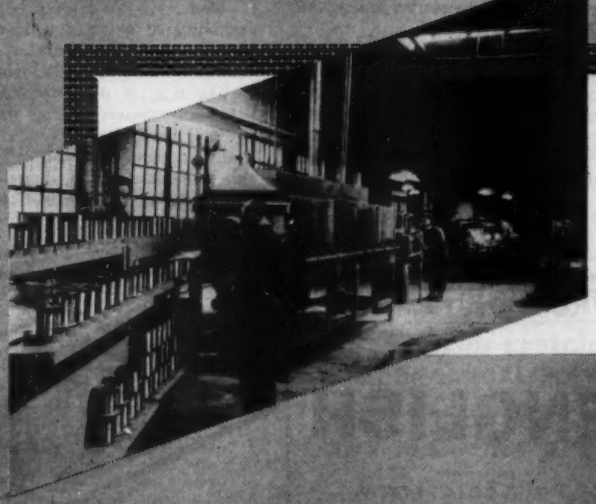
Circle No. 49 on Readers' Service Card

Specialized sugar acids offer unusual advantages as chelating agents

According to the manufacturer, specialized mixtures of the sodium salts of closely related non-toxic polyhydroxy acids are highly efficient and economical sequestering agents for various metallic ions and particularly in strongly alkaline solutions.

Present and suggested applications include metal cleaning and de-rusting, water-

"From ingot to fourdrinier wire"



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EASTWOOD-NEALLEY CORPORATION
Belleville, N. J.

conditioning and paper manufacture. *Pfanstiehl Laboratories Inc.*

Circle No. 50 on Readers' Service Card

Polyester resin emulsion

A new concentrated resin emulsion has been developed and is ready for the market.

When used in aqueous solutions with catalyst on glass cloth or matted glass fibers, the emulsion provides a strongly adhering size with superior, tough, shatter-proof, non-cracking, non-dusting, non-fraying and non-splintering properties. It binds pigments, colors and fillers to the glass fibers with a strong durable bond. Its paleness permits good light transmission and minimum discoloration. *Chemical Products Corp.*

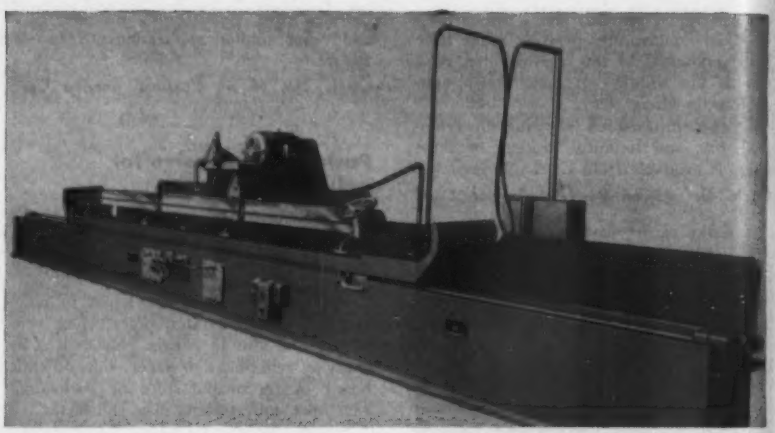
Circle No. 51 on Readers' Service Card

Coupling for light wall stainless steel pipe and tubing

A self-aligning coupling for light wall, plain end stainless steel pipe and tubing has been placed on the market and known as SWEPCO SS.

The coupling is suitable for permanent or temporary connections, emergency repairs or for testing purposes. It is designed for working pressures of 100 psi and for pipe sizes up to 12 in. Gaskets are available in various compositions of synthetic and natural rubber. *Swepco Fittings Inc.*

Circle No. 52 on Readers' Service Card



New heavy-duty knife grinder

Pictured above is the new Model 300 heavy-duty knife grinder. The new model is now ready for the industry with many new and distinct features over previous models.

Model 300 has a much heavier precision spindle and the smallest diameter grinding wheel (26 in. in diameter) and is belt-driven by a 25-hp TEFC motor.

The 8-in. × 8-in. standard knife bar is extremely heavy. It has four precision-ground faces. One face is entirely smooth with no slots, and the other three faces are equipped with knife and fixture mounting slots. This is a distinct feature and is not furnished on other traveling table-type knife grinders except at additional cost.

The grinding head, wheel dresser, knife bar, hydraulic transmission, infeed, wet grinding system and the lubrication system are all considered as standard equipment. Other optional equipment is also available.

The manufacturer states that this machine is ideal for sharpening heavy chipper knives for pulp and paper mills.

The company invites your requests for more technical information about the machine. *Samuel C. Rogers & Co. Inc.*

Circle No. 53 on Readers' Service Card

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In ordering this book write direct to: "Kultura" Hungarian Trading Co. for Books and Newspapers, Budapest 62, Hungary, P. O. Box 149.

UNIT OPERATIONS OF CHEMICAL ENGINEERING. By Warren L. McCabe and Julian C. Smith. Published by McGraw-Hill Book Co. Inc., 330 West 42nd St., New York 36, N.Y. 945 pages. $10.50.

This text is written at an undergraduate level. It covers unit operations of chemical engineering from both a practical and a theoretical standpoint. Each unit operation is treated separately.

Some of the other features of the book are: a simplified understanding of mass transfer; detailed treatment of solids, and treatment of important measuring instruments such as orifice meters and rotameters.

The book includes 113 worked-out examples, nearly 150 unsolved problems, 500 figures and 275 references to the chemical engineering literature.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Faucet for dispensing corrosive fluids

Economy Faucet Co. has issued a flyer describing a new stainless steel faucet for the safe dispensing of flammable and corrosive fluids. The flyer describes the construction of the model and shows the faucet in use.

Circle No. 54 on Readers' Service Card

Industrial water problems

Betz Laboratories Inc. has prepared two technical papers on industrial water problems. Paper No. 134 is titled, "Biological fouling in recirculating cooling water systems". This paper discusses the common problems of slime and algae in these systems and points out how deposits of biological origin can interfere seriously with heat transfer. Paper No. 135 is titled, "Conductivity versus sodium by flame spectrophotometer in steam-purity studies". This paper is the result of a study made by the company indicating that sodium is extremely valuable in evaluating steam purity.

Circle No. 55 on Readers' Service Card

Storage bins for the industry

Neff & Fry Co. has published a 4-page bulletin illustrating and describing the company's "Super-concrete Stave" storage bins for industry. Lists of prominent users and varieties of materials are given, as well as tables of capacities in relation to bin sizes.

Circle No. 56 on Readers' Service Card

Semi-steel valves

Rockwell Mfg Co. has completely revised a 43-page bulletin covering the entire semi-steel valve line which is produced by the company. Large cutaway photos showing in detail the working parts of four types of valves are given, along with other technical descriptions.

Circle No. 57 on Readers' Service Card

Surface active agents

American Cyanamid Co. has released a 51-page booklet which gives technical data on the seven types of "Aerosol" surface agents offered by the company. Basic formulations, data for testing effectiveness and information on storage and handling are also given, along with suggestive uses to which the agents may be put.

Circle No. 58 on Readers' Service Card

Bulk handling of starch

A. E. Staley Mfg. Co., in a recently published bulletin, explains the bulk handling of starches. This bulletin gives a brief description of the types of equipment available for each component of a bulk-handling system, together with average estimates of the costs involved.

Circle No. 59 on Readers' Service Card

Crypto-anionic detergent

Sandoz Inc. is issuing a booklet titled "Sandopah DTC for the Pulp and Paper Industry". The 38-page booklet discusses detergent applications such as deinking, felt washing, rag cooking and bleaching. Tests for detergency, general characteristics and applications are also given.

Circle No. 60 on Readers' Service Card

Process airopumps

Walker Process Equipment Inc. has released a bulletin on its new Airopump line. These air lift pump units are designed specifically for low-lift pumping applications. The bulletin gives complete details with drawings, charts, etc.

Circle No. 61 on Readers' Service Card

Basis weight and moisture control systems for the paper industry

Isotope Products announces the publication of a new bulletin featuring the basic advantages to the papermaker of various engineered machine control systems. The basic control systems using the Betameter for basic weight and Aquatel for moisture control are also outlined on a paper machine illustration. The electronic operation of the Betameter is also discussed along with the application of the Betameter and the Betacoater for coating and impregnation process control.

Circle No. 62 on Readers' Service Card

Stainless steel sheet and strip

Allegheny Ludlum Steel Corp. announces a new 32-page booklet on stainless steel sheet and strip which gives detailed information on these products. There are sections on the proper selection of stainless steel grades and an industry index of applications, including the pulp and paper industry.

Circle No. 63 on Readers' Service Card

Multiple feed oilers

Trico Fuse Mfg Co. features the multiple feed oilers in a bulletin recently published by the company. The bulletin explains how a more accurate and simple feed control is offered by the use of these feed oilers. Two pages are devoted to explain the construction of these feeders.

Circle No. 64 on Readers' Service Card

Air and hydraulic control valves

C. B. Hunt & Son Inc. has just released a bulletin titled, "Quick-As-Wink Air and Hy-

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draulic Control Valves." The 12 pages include illustrations and descriptions of the valves, including sliding sleeve, single plunger, "O"-type, "B"-type and high-pressure hydraulic valves.
Circle No. 65 on Readers' Service Card

A stable anionic emulsion

Mona Industries Inc. is distributing a bulletin on Monapolene A—a stable anionic emulsion of low-molecular weight polyethylene of extremely fine particle size. The bulletin gives explanations on its use and other technical information about the product.
Circle No. 66 on Readers' Service Card

Materials handling ideas

Lewis-Shepard Products Inc. gives a panorama of materials handling ideas for every commercial and industrial situation. Sixteen pages are devoted to depicting the solution to a specific materials handling problem.
Circle No. 67 on Readers' Service Card

Blue book on electric generating plants

D. W. Onan & Sons Inc. has revised its "Blue Book" of general information concerning the selection of engine-driven electric generating plants. The booklet traces the history of electric plant development from early stages where storage batteries were necessary to today's modern single-unit, engine-generator power plants.
Circle No. 68 on Readers' Service Card

Arc and torch welding wall charts

Eutectic welding Alloy Corp. has designed two new wall charts for plant training programs in the practical aspects of torch and arc welding. The charts are simple and easy to understand, and the illustrations demonstrate electrode manipulation techniques, pass sequences for cold welding cracks, for building up crack sensitive deposits, and for avoiding slag entrapments in fill-ins.
Circle No. 69 on Readers' Service Card

Centri-cleaners on paper machines

Bauer Bros. Co. explains the principles of delivering stock direct from the centri-cleaners to the headbox of the paper machine in a bulletin just published by the company. The bulletin goes into considerable detail regarding the operation and construction of centri-cleaners.
Circle No. 70 on Readers' Service Card

Equipment manual for folding boxes

Folding Paper Box Association is offering a concise reference guide on mechanical cartoning equipment. The manual is designed to provide service to carton production and sales personnel in getting information on the best type of equipment for the specific packaging job under consideration.
Circle No. 71 on Readers' Service Card

Pulp bleaching

Hooker Electrochemical Co. has published a comprehensive 60-page book titled "Pulp Bleaching". This book is a compendium of basic knowledge about bleaching based on many years of close experience with the pulp industry. The book contains 52 illustrations showing process flow sheets, diagrams of equipment and graphs of useful data. The company invites your request for this book.
Circle No. 72 on Readers' Service Card

Airveyor uses for pulp and paper mills

Fuller Co. has described the actual operation of the Airveyor as used in the pulp and paper mill industry for handling process chemicals, chips, sawdust and hog fuel in a new 12-page bulletin which is now available. The bulletin tells how the system can be used both for unloading from cars and delivering to storage and for reclaiming materials from storage. A comprehensive list of users is also presented.
Circle No. 73 on Readers' Service Card

Glassed centrifugal pump

Goulds Pumps Inc. has designed a new glassed centrifugal pump for handling corrosive liquids in the chemical process and allied industries. The company offers a bulletin telling the complete breakdown on the construction of these pumps with copy and with photo and diagrammatic drawings.
Circle No. 74 on Readers' Service Card

Net prices for pipe insulation

Union Asbestos Rubber Co. has printed a 28-page booklet giving net prices for pipe insulation. Engineers and estimators can save time and trouble and eliminate errors when working with these pre-computed net prices.
Circle No. 75 on Readers' Service Card

Power loader for use on trucks

L. A. Young Spring & Wire Corp. is issuing a folder describing the company's truck crane power loader. This power loader fits any standard truck chassis and is being recognized as an ideal method of materials handling in loading and unloading.
Circle No. 76 on Readers' Service Card

Impervious graphite entrainment separator

Union Carbide Corp. describes the new "Karbate", the trade name given to the company's impervious graphite entrainment separators, in a recently-published bulletin. Discussing the simple construction of the non-clogging type MV unit, the bulletin explains how the efficient, corrosion-resistant equipment separates entrained liquids from gas streams.
Circle No. 77 on Readers' Service Card

The Paper Industry

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PAPER AND PAPERBOARD MAKING

By HARRY WILLIAMSON
Consulting Engineer and Author of
LESSONS IN PAPER MAKING

Pocket size, cloth bound text book of 372 pages covering all phases of stock preparation and sheet formation including the fundamental principles of making paper on the fourdrinier machine and paperboard on the multiple cylinder machine.

The author has fulfilled a life-long ambition to translate nearly fifty years of practical experience in a book that will be useful to the practical papermaker, technologist and executive.

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CLASSIFIED ADVERTISING

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Graduate Industrial Engineer with practical experience in the paper industry. A knowledge of paper finishing is desirable. Should have ability in organization, expansion, mechanization and labor relations. Under 38 years of age, good salary and benefits. Fine opportunity for a man who is energetic and desires a challenge. Send detailed resume of experience and education to Personnel Manager, West Virginia Pulp and Paper Co., Luke, Maryland.

WANTED

Electrical engineering draftsman for general plant power layout work also automatic control. Give experience and present salary range with application. Location south. Address replies to Box 649, The Paper Industry.

WANTED

Mechanical and structural design engineers and draftsman for plant layout work and automatic equipment. Work involves board work and some field work. Experience in pulp or paper mill helpful but not essential. Location south. Good opportunity for desirable applicants. Give experience and salary range with application. Reply to Box 650, The Paper Industry.

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HUSS ONTONAGON PULP AND PAPER COMPANY
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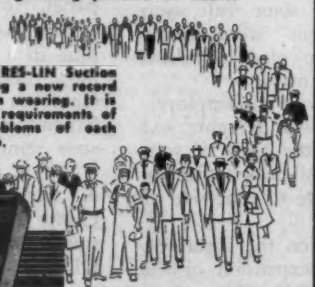
One (1) 150 ton per day, acid-proof, washer and thickener. Must handle stock from ½ of 1% consistency to 12-15% on outlet. Please address replies to Box 652, The Paper Industry.

RESLIN *wire saver*

Suction Box Covers now lead

No other Suction Box Cover offers you so many advantages . . . that's why Mill after Mill have joined the fast growing parade of users.



PROVEN BY TEST, this RES-LIN Suction Box Cover is establishing a new record for longer life and even wearing. It is engineered to meet the requirements of specific production problems of each particular paper machine.

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1. Even distribution of fabric assures EVEN WEARING.
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3. Increased wire life.
4. Many years of trouble-free service.
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7. Reslin can supply a greater open area without sacrificing strength.
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9. Easily installed.
10. No other can offer as even-wearing and wax-like surface as Reslin.

Write for Further Information and Sample of Material

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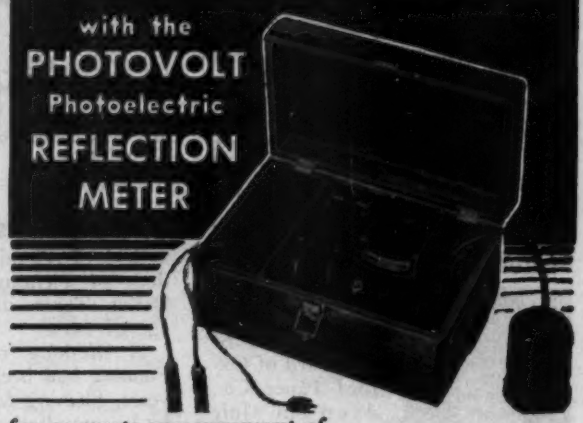

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tests on paper, cardboard, and other paper products.
Portable, reliable, rugged, simple to operate

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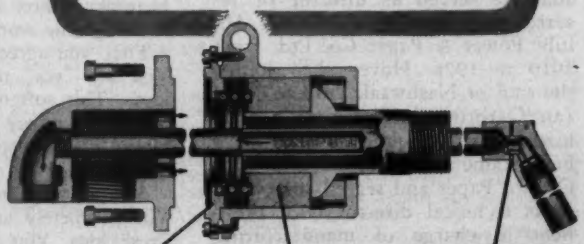
Johnson Joint

SELF-SUPPORTED TYPE
with SYPHON ELBOW



ASSEMBLY PLATE — Holds internal parts in position when head is removed.

SELF-SUPPORTING — Needs no external supports of any kind.

SYPHON ELBOW — Permits use of straight pipe for syphon. Can be inserted or withdrawn right through the joint.

WRITE FOR INFORMATION

Bulletin S-2001 has all the facts on this joint-and-elbow combination that supports itself, has no packing, needs no lubrication, outmodes unwieldy syphon pipes. Johnson Joints are also available in pipe-supported and rod-supported types, to suit all operating needs.

The Johnson Corporation

845 Wood St., Three Rivers, Mich.

Names in the News . . .

(Continued from page 426)

and strip sales at the Cincinnati steel service plant of Joseph T. Ryerson & Son Inc.

Necrology . . .

Rexford W. Hovey

R. W. Hovey

Rexford William Hovey, 64, vice chairman of the board of Oxford Paper Co., died in July at Westhampton Beach, L. I. His home was in Bronxville, N. Y.

A native of Canada, Hovey was a graduate of McGill University in Montreal. Prior to his election as vice chairman of the board in 1956 he had been Oxford's executive vice president. He had been a board member since 1933 and had been associated with the firm 30 years. Hovey was also a director of Oxford Miami Paper Co., Rumford Falls Power Co. and a vice president of Nashwaak Pulp & Paper Co.

From 1915 to 1919 he was chief of the Pulp & Paper Div. of the Forest Products Laboratories and Imperial Munitions Board in Canada. He served as director of research and technical director of Abitibi Power & Paper Co. Ltd. from 1919 to 1926. Hovey then joined the staff of Nashwaak Pulp & Paper (an Oxford subsidiary) as general manager at St. John, N. B. In 1928 he became technical director for Oxford Paper and served successively as technical director, vice president in charge of manufacturing and executive vice president.

During World War II Hovey was director of the Pulp & Paper Div. of the War Production Board. And in 1945 he served as special consultant to the Board's Forest Products Bureau.

Frank J. Dvorak

Frank J. Dvorak, treasurer and a director of Marathon Corp., died recently at the age of 59.

Formerly president of Wisconsin Valley Trust Co. in Wausau, Dvorak joined Marathon in 1941, was elected to its board in 1948, became vice president in charge of finance in 1952 and treasurer in 1954.

He was also vice president, assistant treasurer and a director of Marathon Corp. of Canada Ltd., treasurer of Marathon Southern Corp. and vice president, treasurer and a director of Marathon Foundation Inc.

Ervin T. Fleming Jr.

Ervin T. Fleming Jr., a vice president of Fleming & Sons Inc. in Dallas, Texas, died recently at the age of 54.

A life-long resident of Dallas, Fleming had been with the firm 35 years. Fleming & Sons was founded by his grandfather, John G., in 1893 and has been owned and controlled by the Fleming family since that time.

James S. Gilbert, retired board chairman of Dexter Folder Co., died recently at his Englewood, N. J. home. He was 91.

Maurice Spiller, long-time Maine territory district manager for Lily-Tulip Cup Corp., died recently after a long illness. He had been associated with the firm 20 years.

Better Communications

(Continued from page 405)

raises some objection to doing something or accepting some rule, you employ the "yes, but" word magic. Here is a three-step plan to follow in using this word magic:

First, you agree with the employee. You say "yes" to his thoughts and ideas. This softens the blow of your counter argument and makes the employee more receptive to your side of the issue.

Second, you cushion the argument. This is merely an expansion of the "yes" idea. You agree and you continue with this agreement to get out of the argumentative frame of mind. For instance, you might say: "Yes, I know how you feel about that. I had the same idea for a long time. In fact, I was sure it wouldn't work. But, ..."

Third, you present the other side of the argument with a "but" preface. You will find that this "yes, but" word magic will keep you from starting an argument and will help open the mind of the employees to whom you are talking.

Why not try this word magic in the next employee relations problem that develops?

First, you ask the employee "when" he can do the assigned task. If possible, you give him a choice of "when" he will do it.

Second, you give him an "example" of how the work should be done. Make your illustration crystal clear so there is no misunderstanding.

Third, if an argument develops, handle it with kid gloves by employing the "yes, but" word magic. This will change the argument into a friendly discussion.

Yes, word magic will help you get things done!

Panel Discussion

(Continued from page 407)

pulps. Semichemical is sometimes difficult to pick up on a drum. We have been considering the use of horizontal washers in the semichemical pulp field. The horizontal washer naturally is a vacuum washer—operates practically the same as a drum washer. Thus, the operation is very similar to a drum washer, as far as the cycle is concerned. It is probably a little more feasible to use a greater percentage of the actual area for the active work on a horizontal than a drum, due to the fact that it is in the horizontal plane.

Q. (D. W. Libby, Continental Can Co.) This will change the subject, but there is one question I would like to pose to the group or the panel. In the comparison of the washer loading for hardwood versus pine in a bleachable kraft grade of pulp, does anyone have any comments on the loading of pine versus hardwood for the same efficiency of soda removal?

A. (Ernest G. Evans, Union Bag-Camp Paper Corp.) We have a small two-drum, four-stage set of Olivers. Recently we have started washing hardwood part of the time, the remainder on pine. We find we can obtain equal loading with hardwood if we do not have pine liquor in the system. If you have the soap and foam of the pine in the system, it presents considerable difficulty. However, if you start clean with hardwood, I feel that you can load as much and wash easier. In our expansion we have purchased eight drums, nine 11 x 16's, and we are planning to wash five-stage on pine. For the hardwood, 250 tons, we purchased two-drum, four stage equipment.

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.	
No. 1 white shirt cuttings	13.00—	13.50
Soft unbleached muslins	15.50—	16.00
Fancy shirt cuttings	4.50—	5.00
No. 1 percales	5.50—	6.00
No. 1 washables	2.25—	2.50
No. 1 light silesias	6.50—	7.00
No. 1 light prints	4.75—	5.00
Light flannelettes	6.50—	7.00
Cottonades	2.75—	3.25
Blue overall cuttings	6.75—	7.25
Blue cheviots	6.75—	7.25
Canton flannels, bleached	10.50—	11.00
Canton flannels, unbleached	10.50—	11.00
Osnaburg cuttings	9.50—	10.50
Underwear cuts, bleached	14.50—	15.00
Underwear cuts, unbleached	14.50—	15.00
Sun tan khaki cuttings	5.00—	5.50
American linen cuttings	6.75—	7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.	
No. 1 roofing (Chicago)	.80—	.85
No. 2 roofing (Chicago)	.60—	.65
Twos and blues, repacked	1.50—	1.75
Thirds and blues, repacked	1.50—	1.75
No. 1 whites, repacked	—	
No. 1 whites, miscellaneous	—	
No. 2 whites, repacked	—	
No. 2 whites, miscellaneous	—	

RAGS (Foreign)

(ex dock New York City)

New Rags

	per cwt.
New dark cuttings	Nominal
New mixed cuttings	
New light silesias	
Light flannelettes	
Unbleached cuttings	
New white cuttings	
New light oxfords	
New light prints	

Old Rags

	per cwt.
No. 1 white linens	Nominal
No. 2 white linens	
No. 3 white linens	
No. 4 white linens	
No. 1 white cottons	
No. 2 white cottons	
No. 3 white cottons	
No. 4 white cottons	
Extra light prints	
Ordinary light prints	
Medium light prints	
Dutch blue cottons	
French blue cottons	
French blue linens	
Checks and blues	
Linsey garments	
Bark cottons	
Old shopperies	

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	4.75—	5.00
Gunny No. 1, foreign	4.50—	5.00
No. 1 manila rope, domestic	7.75—	8.25
No. 1 manila rope, foreign	6.25—	6.50
New burlap cuts (soft)	6.00—	6.50
Sisal strings	4.25—	4.50
Mixed strings	1.50—	1.75

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	105.00—	115.00
No. 1 hard white shavings	85.00—	90.00
No. 1 soft white shavings	50.00—	55.00
Soft white shavings, uncoated	55.00—	65.00
Fly leaf shavings No. 1	25.00—	30.00
Fly leaf, woody, No. 1	25.00—	30.00
Mixed colored shavings	18.00—	20.00
No. 1 books and magazines	17.00—	18.00
Ledger stock, white, No. 1 (carloads)	45.00—	50.00
Ledger stock, colored, No. 1 (Midwest ship)	25.00—	
New manila envelope cuttings (free of groundwood)	60.00—	65.00
New manila envelope cuttings (containing groundwood)	50.00—	55.00
Manila tab cards	50.00—	60.00
Colored tab cards	40.00—	50.00
New northern kraft envelope cuttings	60.00—	65.00
Triple sorted kraft, 100%	25.00—	30.00
No. 1 old kraft	25.00—	
White news cuts, No. 1	50.00—	55.00
No. 1 oversisue news	14.00—	16.00
Folded news, special	12.00—	13.00
Folded news, ordinary	9.00—	11.00
Old corrugated boxes	17.00—	18.00
New jute corrugated cuts	19.00—	20.00
Mill wrappers	9.00—	11.00
Boxboard cuttings	6.00—	7.00
No. 1 mixed paper	2.00—	3.00

CHEMICALS

F.o.b. New York City

Alum, ammonium		
Granular, bags, works, cwt.	4.30—	
Lump, drums, works, cwt	5.05—	
Powdered, drums, works, cwt	5.20—	
1-Arginine, drums, kilo	74.80—	
Blanc Fixe		
Direct process, bags, c.l., works, ton	110.00—	
L. c. l., ton		
Bleaching Powder, drums, cwt		
Casein, domestic acid precipitated		
30-mesh bags, 10,000-lb. lots or more, shipping point, lb		.56
80-mesh bags, 10,000-lb. lots or more, shipping point, lb		.64
China Clay, domestic dry-ground, airfloat, 99%		
325-mesh, bags, c. l., Georgia works, ton	10.00—	
300-mesh, bags, c. l., Georgia works, ton	13.50—	14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00—	35.00
Chlorine, liquid		
Tanks, single units, works, freight equaled, cwt	3.15—	
Glycerine, refined (CP, USP) 99%, drums, c. l., delivered lb.	.29½—	
Litharge, commercial powdered		
Barrels, c. l., works, freight equalled, lb.	.16—	
Rosin, gum, c. l., f.o.b. New York, cwt		
E	—	
F	—	
G	8.75—	
WW	9.40—	
Rosin, wood, c. l., f.o.b., shipping point, cwt.		
K, M	7.60—	
N	7.70—	
WG	8.15—	
WW	8.40—	
Saltcake, domestic, bulk Works, 100% Na_2SO_4 basis ton	28.00—	
Soda Ash		
Dense, 58%, paper bags, c.l. works, cwt	1.90—	
Light, 58%, paper bags, c. l. works, cwt	1.85—	
Soda, caustic		
Flake, 76%, drums, c. l. works, freight equalled, cwt.	4.70—	
Solid, 76%, drums, c. l. works, cwt.	4.30—	
Sodium Silicate		
40°Be, 1:3, 2, turbid, drums, c. l., works, cwt.	1.55—	
52°Be, turbid, 1:2, 4, drums, c. l., works, cwt.	2.65—	
Starch		
Pearl, 140-lb. bags, cwt.	7.47—	
Pearl, 100-lb. bags, cwt.	7.32—	
Powdered, 100-lb. paper bags, cwt.	7.44—	
Sulfur, crude		
Bulk, c. l. mine, contract, long ton	26.50—	
Talc		
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—	
Canadian, ground, bags, c. l. works, ton	20.00—	35.00
Titanium Pigment		
Calcium-rutile base, regular, bags, c. l., lb.	.09¼—	
High-tinting, drums, c. l., lb.	.09 —	
Zinc Oxide Pigment, American process		
Lead-free, bags, c. l., freight allowed, lb.	.14½—	
Leaded, 35%, bags, c. l., freight allowed, lb.	.15½—	

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	150.00—
Bleached sulfite, Canadian	150.00—
Unbleached sulfite	130.00—
Unbleached sulfite, Canadian	130.00—
Bleached soda	145.00—
Bleached soda, Canadian	145.00—
Kraft, bleached hardwood	150.00—
Kraft, bleached	152.00—155.00
Kraft, bleached southern	155.00—
Kraft, bleached Canadian	155.00—
Kraft, unbleached southern	117.50—122.50
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	130.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	140.00—
Sulfite screenings	72.50—
Sulfate screenings	67.50—
Groundwood, dom.	82.50— 90.00

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	150.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	150.00—
Bleached sulfite, Finish, freight allowed	150.00—
Unbleached sulfite, Swedish, freight allowed	130.00—
Unbleached sulfite, Finnish, freight allowed	130.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	155.00—
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.66
White patent coated	
.020	175.00
.018	177.50
.016	182.50
Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	20.05
No. 2 enamels	19.05
Machine-coated, 45- to 100-lb.	15.05— 18.50
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	17.05
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	16.15
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	63.20
75% "	48.45
50% "	36.95
25% "	31.00
Rag Content Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
100% rag	64.40
75% "	49.60
50% "	38.10
25% "	32.20
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	22.50
No. 2	21.75
No. 4	20.35
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	23.70
No. 2	22.95
No. 4	21.55
Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials
Tissues (carlots)	per ream
White No. 1	
White No. 2	
Bleached anti-tarnish	
Colored	
Anti-tarnish kraft	
Manila	
Napkins, semi-crepe (12½ lb. to M shts) per case	
Napkins, full crepe and embossed (12½ lb. to M shts) per case	
Toilet, bleached (M shts) per case	
Toilet, unbleached (M shts) per case	
Wrappings (kraft, basis 50 lb. and heavier)	per cwt
Standard wrapping	9.50
Butchers, counter rolls	10.50
Standard bagging, mill rolls	
Shipping sack, mill rolls	
Gumming, mill rolls	
Asphalting, mill rolls	
Envelope, mill rolls	

SAFETY NEWS

MAJOR ONTARIO SAFETY award is presented to the Terrace Bay mill of LongLac Pulp & Paper Co. Ltd. by the Ontario Pulp & Paper Makers' Safety Association. Shown here receiving the plaque from George L. Carruthers (r) is J. C. Wig, mill manager. Carruthers is president of the Association and president and general manager of Interlake Tissue Mills

LongLac Wins Major Ontario Safety Award

LongLac Pulp & Paper Co. Ltd. at Terrace Bay, Ont., has won the 1956 Ontario-wide Accident Prevention Competition for Class "A" pulp and paper mills (those working more than 50,000 man-hours per month). The contest is sponsored by the Ontario Pulp & Paper Makers' Safety Association, and the award was made during that group's 42nd annual meeting.

The Terrace Bay mill went into production in 1948 and in the following year placed seventh in the Ontario competition. In the intervening years prior to placing first in 1956, the mill finished fourth once, third once and second four times. During that period, however, the mill received more than a dozen awards in other safety competitions. Included were certificates of merit and achievement from the American Paper & Pulp Association, the Ontario Pulp & Paper Makers' Safety Association and the National Safety Council.

Since the 1948 start-up, the Terrace Bay mill has chalked up nearly 11,000,000 man-hours with an average of less than five lost-time injuries for every 1,000,000 man-hours worked. During the past five years the mill has operated with less than three lost-time injuries per 1,000,000 man-hours.

Mill manager is J. C. Wig, while services and safety supervisor at Terrace Bay is Fred O. Soughton.

Pulp & Paper Ranks 21st Among NSC Members

The pulp and paper industry stood 21st among all industries reporting their frequency rates to the National Safety Council during 1956. Pulp and paper had a rate of 7.24, as compared to the all-industry average of 6.38.

Workers employed by member companies of the NSC suffered fewer injuries than in 1955, and the ones they did have were less severe. Thirty of the 40 basic industry classifications either reduced their frequency rates or remained unchanged from the previous year. Half either cut their severity rates or remained unchanged.

The communications industry again led the field with a frequency rate of 0.99. Electrical equipment —second in 1955—was nudged from that position by aircraft manufacturing, which had a rate of 1.92, a 14-per cent reduction. Electrical equipment was third was 2.01, a 6-per cent improvement.

Industries ranking ahead of pulp and paper were: communications, aircraft manufacturing, electrical equipment, automobile, cement, tobacco, rubber, chemical, steel, shipbuilding, sheet metal, storage and warehousing, miscellaneous manufacturing, textile, glass, railroad equipment, machinery, printing and publishing, service and electric utilities.

19 Perfect Records for First Quarter Reported by SPPSA

A TOTAL of 19 perfect scores have been reported for the first three months of 1957 by members of the Southern Pulp & Paper Safety Association. Of these, 12 are mills; two bag plants; one box plant, and four wood operators.

In the mill division, Brunswick Pulp & Paper Co. at Brunswick, Ga., leads with a 0.00 frequency rate in 388,651 man-hours of exposure. Safety supervisor at Brunswick is W. B. Ballinger.

For the first quarter the average frequency rate for the 64 participants among pulp and paper mills was 7.15. Last year the rate was 6.17, while in 1955 it was 7.43.

Other perfect records among the mills (with man-hours shown in parentheses) were: Owens-Illinois Glass Co. (National Container Div.), Jacksonville, Fla. (342,153); Buckeye Cellulose Corp., Memphis, Tenn. (331,903); Halifax Paper Co. Inc., Roanoke Rapids, N. C. (330,-172); Chesapeake Corp. of Virginia, West Point, Va. (323,257);

Buckeye Cellulose Corp., Foley, Fla. (278,498); Rayonier Inc., Jesup, Ga. (234,726); Flintkote Co., Meridian, Miss. (227,781); Certain-Teed Products Corp., Savannah, Ga. (104,246); Orange Pulp & Paper Mills Inc., Orange, Texas (62,736); Mead Corp., Nashville, Tenn. (58,467); Banner Fibreboard Co. Wellsburg, W. Va. (22,957).

Converting Industries

Leader among the bag plants was Hudson Pulp & Paper Corp. at Palatka, Fla., where a perfect score was recorded in 203,277 man-hours. Safety supervisor at Hudson is Winton E. Henson.

The average frequency among all bag plants was 7.74. For the year 1956 it was 7.17 and for 1955, 4.22.

The other perfect record in the bag manufacturing category was scored by Albemarle Paper Mfg. Co. in Richmond, Va. The plant worked a total of 89,701 man-hours.

The one perfect score in the box plant division was that of Owens-Illinois Glass Co. (National Container Div.) at Jacksonville, Fla. T. A. Reynolds, safety supervisor, reported a frequency rate of 0.00 in 128,611 man-hours.

The average frequency among all box plants was 7.67. For the year 1956 it was 7.88 and for 1955, 8.77.

Woods Operations

Four woods operators had perfect frequency ratings in the first three months. Leader was North Carolina Pulp Co. at Plymouth, N. C., where 156,261 man-hours were worked without a disabling injury. Personnel director is Howard B. Gaylord.

Other perfect scores in the category were those of Rayonier Inc., Fernandina Beach, Fla. (77,963); Scott Paper Co. (Hollingsworth & Whitney Div.), Mobile, Ala. (30,848), and Container Corp. of America, Fernandina Beach (26,469).

The average first-quarter frequency rate for all woods operations reporting to the SPPSA was 14.09, as compared to 22.04 in 1956 and 13.90 in 1955.

Kimberly-Clark Corp's

mill at Kimberly, Wis., recently passed the 1,000,000 - man - hour mark without a lost-time injury. On the two other occasions when the plant passed the mark it went on to surpass the 2,000,000 record. In 1951 the workers achieved 2,964,923 accident-free man-hours, while in 1953-54 the mark was 2,354,355.

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Plastics in competition with paper and board

Currently introduced plastic wrap and plastic bags for bakery products—as well as disposable plastic plates and drinking cups, while still confined largely to specialty applications, may become a serious competitor in many fields traditionally held by paper and paperboard.

The use of lower cost materials and methods, the output of improved products and a maximum of automation in processes seem to be the key points around which this competition will be resolved.

Greater use of color

According to Cellu-Letter, there are currently 291 newspapers offering advertisers and readers three colors in addition to black. This is an increase of almost 100 per cent over the number of newspapers using three different colors in 1952.

Packaging materials, it is stated, now take 40 per cent of the $250,000,000 printing ink output in the U.S.A.

The impact of packaging in Sweden

The ingenuity and inventiveness of the modern Swedish packaging industry have been the main reasons for putting Sweden into the leading position with regard to the per capita number of self-service stores in existence. There are 350 of such self-service stores per million inhabitants in Sweden. Among recent accomplishments made by A. B. Akerlund and Rausig are air- and moisture-proof packaging for bread and dough and vacuum packaging for skinless frankfurters.

A decade of booming business

According to "Dun's Review and Modern Industry", a Dun & Bradstreet publication, a "Presidents' Panel" consisting of 110 presidents of America's 400 largest corporations predicts that between now and 1967 America's industrial growth will break all previous gross sales records, which will climb anywhere from 26-300 per cent.

About 75 per cent of the panelists are confident that no major economic recession will occur in the coming decade. Only 12 of the 110 panel members see any likelihood of a major depression during the next ten years, with 7 out of these 12 ruling out such possibility until some time after 1960.

Ultra-high-strength steel

A steel, heat-treated to a strength of 285,000 psi, with high impact resistance and sufficient ductility for structural applications has been developed experimentally by the National Bureau of Standards. The steel is made by normal melting and working processes and should not be difficult to manufacture.

A better bale package for cotton

In a search for a better bale package for cotton, large scale tests will be made this year to evaluate the use of knitted paper in this application. If successful, knitted paper may provide a reasonable compromise between the need for complete bale coverage and the need for the cotton bale to "breathe".

Now Solving Problems On the Spot In Mills Throughout The Country

This miniature saveall originally was designed and put to work in DARLING's laboratory . . . developing improved flocculation techniques for flotation savealls.

Having proved its worth in our laboratory, it is now being used right in the paper mill, working with white waters just as they come from the machines.

Guided by this pre-testing, the full-scale operating tests have shown many mills that—

In the majority of cases, one of DARLING's specifically-formulated GLUES reduced costs while maintaining or improving recovery efficiency.

Our Technical Service Representative would like to work with you in determining what can be accomplished in your mill. The cost of the glue and technical service are on us, so you've nothing to lose—much to gain. Arrangements can be made through your DARLING SALES REPRESENTATIVE. Or write, call, or wire us direct.

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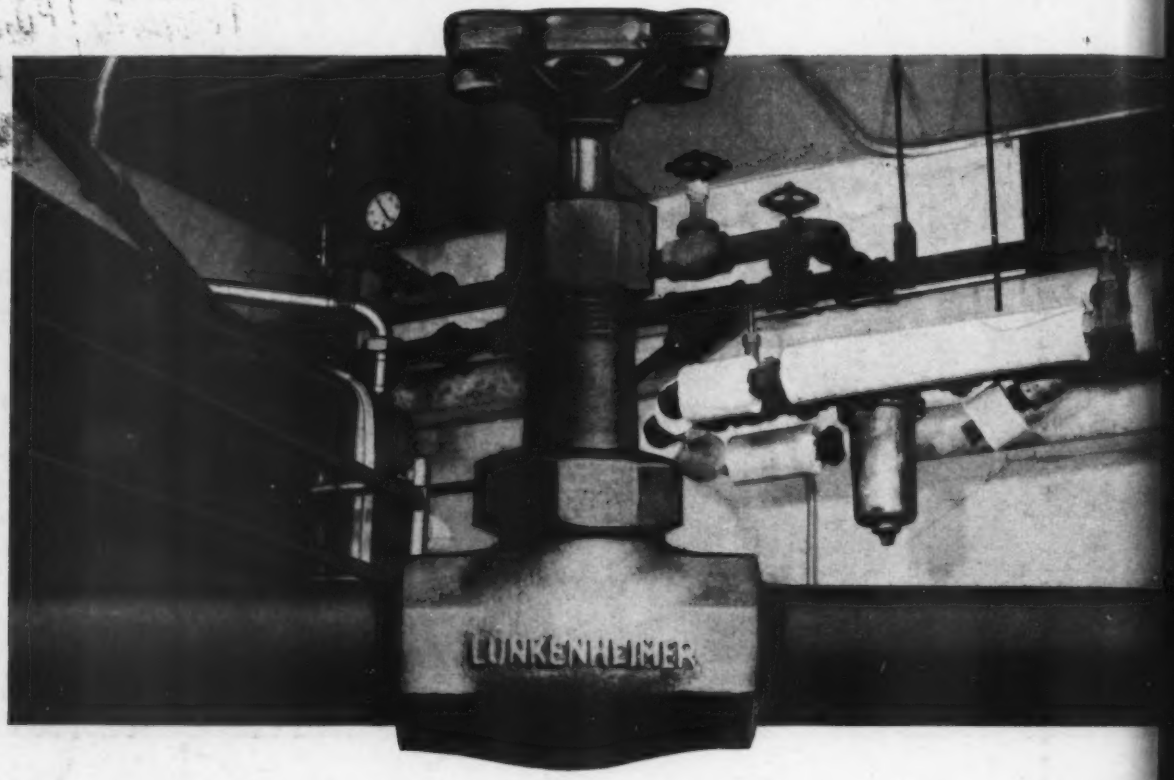

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The moment a maintenance man touches a wrench to a valve, its cost can double. You can't bring down that labor expense in many plants, but you can buy valves with an outstanding record of trouble-free service. At no time in history has valve quality been more important to your total plant expense. And quality has been a tradition for nearly a hundred years at The Lunkenheimer Company, Box 360, Annex Station, Cincinnati 14, Ohio.

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